Engineering

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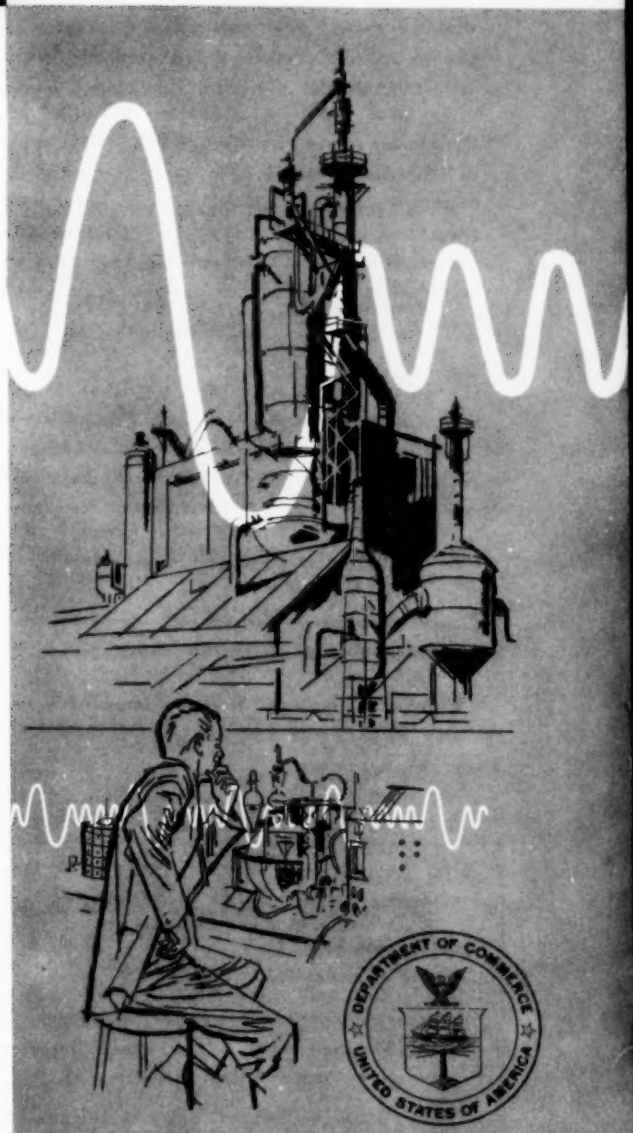
Contents

Chemicals and Applied Products	193
Drugs and Pharmaceuticals	193
Detergents	193
Paints, Varnishes and Lacquers	193
Miscellaneous Chemicals	193
Electrical Machinery	195
Electronics	195
Generators, Motors, Transmission	196
Miscellaneous	198
Fuels and Lubricants	199
Highways and Bridges	200
Instruments	200
Lumber and Wood Products	203
Machinery	203
Medical Research and Practice	204
Metals and Metal Products	205
Meteorology and Climatology	209
Minerals and Mineral Products	211
Ordnance and Accessories	211
Paper and Allied Products	212
Personnel Aptitude Testing	212
Photographic and Optical Goods	213
Physics	214
General	214
Nuclear	216
Physiology	217
Psychology	217
Rubber and Rubber Products	218
Structural Engineering	218
Textiles and Textile Products	220
Transportation Equipment	221
Aeronautics	221
Aircraft	221
Instruments	224
Engines and Propellers	224
Training and Training Devices	225
Aerodynamics	225
Marine Transportation	226
Water Supply	227
Miscellaneous	229
Nuclear Reports of Interest to Industry	234
Catalog of Technical Reports	239



U. S. DEPARTMENT OF COMMERCE

Office of Technical Services

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OFFICE OF TECHNICAL SERVICES

Vol. 22, No. 5 November 19, 1954

CHEMICALS AND ALLIED PRODUCTS

Drugs and Pharmaceuticals

Biological and medical aspects of ionizing radiation: The effect of X-irradiation on the action of analgesic drugs, by John C. Ballin and James L. Wilding. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Apr 1954. 6p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115262

The influence of whole body x-irradiation on the pharmacological response to analgesic drugs was studied, as well as the effect of these agents on radiation toxicity. Contract no. AF 33(038)-27353. AAF SAM Proj 21-3501-0005, Report no. 14.

Detergents

Properties of detergent solutions. Third technical report under Contract no. N6-onr-25130, Project no. NR 054-244: I. Light scattering by detergent solutions. II. Heats of solution of detergents, by Eric Hutchinson, Lorraine Winslow, Kenneth Manchester. Stanford University. Dept. of Chemistry, Stanford, Calif. Nov 1953. 46p drawings, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111459

For 1st report see PB 110773.
1. Detergents - Solutions - Physical properties 2. Detergents - Research 3. Detergents - Heats of solution 4. Light - Scattering - Theory 5. Light - Scattering - Measurements.

Paints, Varnishes and Lacquers

Protection of selenium rectifiers against damage by mercurial fungicides, by John M. Leonard and Constance E. Patouillet. U. S. Naval Research Laboratory. Jun 1954. 22p diagr, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111443

The study reported here is directed at finding a coating material applicable to the rectifier and impervious to mercury vapor. Oleoresinous varnishes and waxes were inadequate. Formulations containing thiokol and vinyl resins in a 1:1.5 ratio were highly efficacious. NRL R 4376.

Miscellaneous Chemicals

Action of polar organic inhibitors in the acid dissolution of metals, by Norman Hackerman and A. C. Makrides. Texas. University. Dept. of Chemistry, Austin, Texas. Oct 1953. 18p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111451

The theory of cathodic inhibition by polar organic compounds principally developed by Mann and his co-workers is critically examined and found inadequate to account for experimental results reported in the literature. A mechanism for inhibition by polar organic compounds based on recent advances in the field of chemisorption on metals is presented. Contract Nonr-375(02).

Applications of voltammetry at constant current in chemical kinetics, by Paul Delahay. Louisiana State University. Dept. of Chemistry, Baton Rouge, La. Dec 1953. 24p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115106

Various kinetic and catalytic processes in voltammetry at constant current are treated, and theoretical and experimental methods for the determination of rate constants are presented. The conditions under which the method can be applied are examined, and

potentialities of the constant current method in chemical kinetics are compared with those of polarography. Report no. 14, Project NR-051-258.

Evaporation from the surface of a body in an airstream (with particular reference to the chemical method of indicating boundary-layer transition), by P. R. Owen and A. O. Ormerod. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1951. 42p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.85. PB 115137

Cover date is 1954. S. O. code no. 23-2875.
1. Boundary layer - Transition point - Gt. Brit. 2. Evaporation - Theory - Gt. Brit. 3. Evaporation - Gases in air - Gt. Brit. 4. Gases - Diffusion - Theory - Gt. Brit. 5. ARC RM 2875.

Fundamental study of foams and emulsions, by Emil J. Burcik and Robert C. Newman. Pennsylvania State College. Mineral Industries Experiment Station. Aug 1953. 24p graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111420

The vibrating jet technique has been used to determine the effect of organic additives on the rate of surface tension lowering. The effect of structure of sodium dodecyl sulfate and sodium tetradecyl sulfate isomers on the rate of surface tension lowering was also investigated. Technical report, Sep 1, 1952 to Aug 31, 1953, under Contract Nonr-656(04), NR 092-110.

Indian synthesis: Synthesis of pure nitramines and azides. Semi-annual progress report covering the period Feb 1, 1954 to Jul 31, 1954, under Contract no. Nonr-622(02), by Glenn S. Skinner. Delaware. University. Dept. of Chemistry, Newark, Del. Aug 1954. 12p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115066

Synthesis of n-propyl-, ethyl- and methylnitramine covered as well as plans for some pure azido and trinitro compounds of the type $R\text{-}C(NO_2)_3$. Synthesis of 1,6-diamino-2,3,4,5-hexanetetrol dihydrochloride.

Investigation of adhesives: Metal-to-metal bonding, by Jack F. Furrer and William A. Merlack. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Apr 1954. 15p table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111445

The object of the work described in this report was to investigate the use of resinous-type adhesives as a replacement or alternate for soft solder in bonding galvanized steel screens to cold-rolled steel shrouds in the tail fin assembly. Tensile tests of the adhesives investigated were compared with soft solder after storage in three climatic conditions, desert, tropical, and arctic. Project 4-91-06-002. CC CRL R 254.

Molecular motion in organosiloxane compounds. Final report under Contract N5ori-07650-NR 052-278, by Hugh G. LeClair, James C. Sternberg, Eugene G. Rochow. Harvard University. Dept. of Chemistry. Sep 1953. 154p diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $3.00. PB 111452

The question of molecular motion in the solid state of organosilicon compounds has been investigated by means of the technique of nuclear magnetic resonance absorption. A radiofrequency spectrometer and permanent magnet have been constructed for use in this research. The operation of the spectrometer is described and its applicability to other types of problems has been discussed.

Quarterly periodic status report under Contract N5ori-07819, NR-092-008, by R. L. Wentworth. Massachusetts Institute of Technology. Hydrogen Peroxide Laboratories. Dec 1953. 12p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115065

DIC 6552.
1. Hydrogen peroxide - Research 2. Hydrogen peroxide - Stability 3. Hydrogen peroxide - Decomposition 4. MIT DIC R 6552.

Research in the physical and structural analysis of high polymers by punched card methods. Final report, Feb 27, 1948-May 25, 1953, under Contract N6-onr-228, T. O. I, Project NR 330-006, by Gilbert W. King. Little, Arthur D., Inc., Cambridge, Mass. May 1953. 45p tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.50. PB 111485

C-57848.
1. Polymers, High - Structure 2. Polymers, High - Physical properties 3. Punched card system.

Solid state properties and catalytic activity. Tenth periodic status report, Oct 1, 1953-Dec 31, 1953, under Contract no. N6onr-27018, NR 051-265, by Hugh Taylor. Princeton University. Dept. of Chemistry. Jan 1954. 5p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115107

For 9th report see PB 114084.
1. Catalysts, Oxidation 2. Ions - Exchange processes 3. Cyclopropane - Hydrogenation 4. Nitrogen oxides - Decomposition 5. Antimony compounds, Organic - Decomposition.

Steric factors in organic chemistry, by Shalom Sarel and Melvin S. Newman. Ohio State University Research Foundation, Columbus, Ohio. Oct 1953. 13p tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111450

The synthesis of a number of acids, alcohols derived by reduction, and the acetates of these alcohols is described. Physical properties and yields are tabulated. The rates of alkaline hydrolysis of these acetates at 20° and 30° in aqueous dioxane have been measured and calculations of rate constants and thermodynamic properties have been made. Contract no. Nonr-495(04), NR-055-298, Technical report no. 2. RF Project 497, Report no. 1.

ELECTRICAL MACHINERY

Electronics

Crystal units, low frequency, services for research and development. Final report under Contract no. NObsr-42409. Radio Corporation of America. RCA Victor Division, Camden, N. J. Dec 1950. 210p photos, diagrs, graphs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $7.75, Photocopy $26.50. PB 115057

The first phase of this investigation consisted of obtaining and testing approximately 100 commercial crystal units in the range from 80 KC to 250 KC. The second phase of this study comprised fabrication and testing of nearly 100 tabulated units of improved construction, which were designed to overcome the faults of the commercial units. The third phase of this investigation consisted of deriving an applicable aging prediction formula, which may be employed to predetermine whether or not units will meet the ±.0005% aging requirement in six months. A brief study of simultaneous operation of two crystal units in series and in parallel was made.

Diffraction by a strip, by A. Erdèlyi and C. H. Papas. California Institute of Technology. Electrical Engineering Dept., Pasadena, Calif. Nov 1953. 11p diagr, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 114771

Contract Nonr-220(14), NR 071-262. Technical report no. 1.
1. Waves, Electromagnetic - Diffraction - Theory
2. Equations, Integral.

Examination of thermal characteristics of some cast electronic equipment structures with a collateral investigation of bulb temperatures, by George L. Mott and Robert Keller. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. Mar 1954. 117p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photocopy $15.25. PB 115207

This memorandum shows various techniques employed: cast magnesium chassis, thermal tube shields, cold plates and favorable placement of vulnerable parts. Dept. of the Army project no. 3-24-06-037. Signal Corps project no. 823-0. SCEL TM M-1532.

Maximum-minimum shift method for measuring complex dielectric constants and permeabilities, by Ronold King. Harvard University. Cruft Laboratory. Dec 1953. 33p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115165

An absolute method for measuring dielectric constants of solids and liquids which is described in the literature is generalized to permit the determination of both dielectric constant and permeability of a moderately low-loss solid or fluid medium. The determination of losses involving complex dielectric constants and permeabilities is also described. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 192.

Radar, a report on science at war, released by the Joint Board on Scientific Information Policy for Office of Scientific Research and Development, War Department, Navy Department. U. S. Joint Board on Scientific Information Policy. Aug 1945. 55p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 114957

1. Radar 2. Radar - History 3. Radar - Operation 4. Radar - Performance 5. Radar - Theory.

Research in physical electronics. Quarterly progress report no. 6 under Contract no. AF 19(604)-524 for the period 15 Dec 1953 to 15 Mar 1954. Illinois. Engineering Experiment Station. Electrical Engineering Research Laboratory. Electron Tube Research Section. Apr 1954. 114p photos, drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photocopy $15.25. PB 115048

Contents: Part I. Introduction. - Part II. High speed oscillography and micro-time analysis, by H. M. Von Foerster. - 1.1. Time dispersion of secondary electrons, by E. W. Ernst. - 1.2. Space charge effect in ultrahigh-frequency modulated electron beams. - 2.1. Space charge effects in velocity modulated electron beams (Klystron tubes), by M. Weinstein. - 2.2. Space charge effects in density modulated electron beams (Traveling wave tubes), by O. T. Purl. - 2.3. Transmission-line tubes, by Vernon J. Fowler. - Part III. Gaseous electronics, by L. Goldstein. 1. Electromagnetic wave propagation in anisotropic media. - 1.1. Interaction of electromagnetic waves, cross modulation and associated effects, by J. M. Anderson. - Appendix. Interaction of microwaves in gaseous discharge plasmas and the Ramsauer effect.- 1.2. Anisotropy due to magnetic fields, by J. Etter. - 1.3. Magneto-electron resonance phenomena, by M. Gilden. - 2. Fundamental studies of gaseous discharges using microwave techniques, by C. L. Coates.

Research services and investigations on subminiature multielement diodes and bistable elements for microtronic circuits. First summary report

for period Sep 20, 1951 to Oct 23, 1953, under Contract no. AF 19(604)-55, by E. B. Dale and C. S. Peet. Battelle Memorial Institute, Columbus, O. May 1954. 54p photos, drawing, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115054

This research was undertaken with the objective of developing subminiature active elements which could be used in a transistorized computer. Semiconductor devices, particularly of germanium and silicon, were to be developed. The program has fallen naturally into three phases. These are (1) preparation of materials, (2) experiments concerning phenomena associated with transistor action, and (3) experimental preparation and evaluation of devices. The research described in this report, which covers the first two years of the work, is concerned primarily with the first two phases.

Study of certain problems in the field of absorption of microwave energy in the atmosphere. Quarterly progress report III, period January 13, 1954-April 12, 1954, under Contract no. AF 19(604)-831, by Edwin K. Gora. Providence College, Providence, R. I. Apr 1954. 17p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115001

1. Radio waves - Absorption - Theory 2. Mathieu functions (Aerodynamics) 3. Atmosphere, Upper - Ozone - Microwave absorption.

Generators, Motors, Transmission

Accuracy of a self-balancing bridge in the measurement of microwave power, by Leonard Sweet and Norman Chasek. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. Oct 1952. 41p photos, diagrs, graph, tables Available from Library of Congress, Publication Board Project,Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115162

The operation of a self-balancing bolometer bridge is analyzed under two separate conditions: c-w power measurement and pulsed r-f power measurement. The c-w analysis includes errors due to: changes in amplifier gain, added phase shift in the amplifier, capacitive unbalance in the bridge, and changes in capacitive unbalance. The error in pulsed power measurements due to the nonlinear dependence of the bridge feedback factor on bolometer resistance is analyzed. Additional problems such as the accurate measurement of the audio power when the waveform is distorted by the pulsing of the bolometer and lock-in of the oscillator by harmonics of the pulse repetition frequency under conditions of d-c biasing are discussed. Experimental results are given for c-w and pulsed power measurements. Research report R-285-52. Contract no. AF-30(604)-18. Photos will not reproduce. PIB 224.

Design of metallized-glass-dissipative-wall variable waveguide attenuator, by Anthony B. Giordano and Richard Bogner. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. Apr 1950. 51p drawings, graphs (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115157

This report deals with the design and development of a dissipative-wall waveguide attenuator utilizing metallized-glass. Preliminary design data are presented, together with a design procedure. Also included is a theoretical analysis of a model and a procedure for realizing an optimum design. Report R-232-50. Contract no. W28-099-ac-197. PIB 177.

Development of attenuators (8.2-39.0 kmc) and attenuation measuring console (0.5-39.0 kmc). Final report under Contract no. W28-099-ac-197, by Anthony B. Giordano. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. Mar 1953. 77p drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115163

Accomplishments as related to harmonic generators, a hetrodyne receiver for microwave attenuation measurements, evaluation of bolometer errors, production of metallized-glass film plates, design of broadband waveguide attenuators, phase-shift measurements of attenuators, the development of a dissipative-wall waveguide attenuator, and the design of an attenuation measuring console are described. Report R-313-53. Some pages will not reproduce well. PIB 251.

Development of subminiature high-temperature capacitors. Interim engineering report no. 5 for the period 28 Jan 1954 to 28 Apr 1954, under Contract no. AF 33(038)-17190, Supplemental agreement no. 3, by H. Mack Thaxton. Balco Research Laboratory, Newark, N. J. May 1954. 25p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115172

1. Capacitors, High temperature - Subminiature
2. Capacitors, Plastic dielectric - Stability.

Engineering study of ferromagnetic structures and materials, by D. E. Bovey. General Electric Co. General Engineering Laboratory, Schenectady, N.Y. Apr 1954. 90p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 115049

Twenty-three specimens of the recently developed high quality magnetic materials, including ferrites and thin gage strip wound cores, were compared in preliminary tests by making dynamic hysteresis loops and core loss measurements. A new oscillator that can be controlled with the low Q inductors to secure frequency modulated carriers was developed, and is described. Magnetic design data and procedures for 0.002 inch Supermalloy in the frequency range from 500 cycles to one megacycle are included. Contract no. AF 33(616)-72. AAF WADC TR 54-15.

Evaluation of bolometer errors in the measurement of attenuation using a bolometer detector, and construction of a bolometer element for waveguide $\frac{1}{2}$" x 1/4" x .040", by Anthony B. Giordano. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. 1948. 19p drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115155

An analysis of the evaluation of bolometer errors in the measurement of attenuation using a bolometer detector is presented. Factors influencing bolometer errors are described and experimental results are presented. A step-by-step procedure is presented which describes the construction of a bolometer unit for waveguide size 1/2" x 1/4" x .040". Report R-172-48. Contract no. W28-099-ac-197. PIB 118.

Homopolar generators and liquid metal brushes, a bibliography, by M. Greenhill. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1954. 6p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 115030

S. O. code no. 70-674-1-69.
1. Generators - Bibliography - Gt. Brit. 2. Generators - Brushes - Bibliography - Gt. Brit. 3. Atomic power - Research 4. AERE Inf/Bib 92.

Metallized film attenuator plates: Production and quality control, by Hubert W. Schleuning. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. Sep 1950. 28p photos, drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115159

A detailed account is given of the method used to fabricate this type of plate as representative of the general process. The quality controls that must be exercised during the process of metallization are also discussed. The conclusion of this discussion deals with problems which have developed with the advent of large size attenuator plates. Report R-236-50. Contract no. W28-099-ac-197. PIB 181.

Multiple object tracking system. Final report for Air Force Cambridge Research Center, under Contract no. AF 19(604)-1051. Phebco, Inc., Baltimore, Md. May 1954. 76p drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115200

The equipment resulting from this crash program is called the Multiple Object Tracking System (MOTS) and this system is described in detail herein. This report contains a review of the existing MOTS; a list of recommended improvements; a detailed description of a system incorporating the improvements recommended; a discussion of the geometry involved; a discussion of several aids to data processing, and a brief description of a possible long-range tracking system. Will not reproduce well.

New magnetic servo amplifier, by J. W. Kallander. U. S. Naval Research Laboratory. Jun 1954. 29p photos, diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111442

This paper presents two new magnetic servo amplifiers. One is merely presented, since its components seriously limit its usefulness. The other is described in considerable detail. Qualitative and quantitative analyses based on the volt-time integral method are given for this amplifier. Oscillograms of the load current of a typical ac-controlled high-impedance amplifier are given. The open-loop frequency characteristics of this amplifier when driving a two-phase servo motor are also given. NRL R 4373.

On the uniformity of evaporated metallic film attenuator plates, by Hubert W. Schleuning. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. Sep 1951. 59p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115160

Some theoretical investigations have been made to determine what distribution can be expected, and what might cause variations in that distribution. Experimental work carried on to improve uniformity of distribution is discussed. Report R-252-51. Contract no. NObsr-43360. Index no. NE-100-402. PIB 193.

Production of metallized film glass attenuator plates, by Clifford T. Graham and Hubert W. Schleuning. Polytechnic Institute of Brooklyn. Microwave Research Institute. Nov 1949. 43p photos, drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115127

A detailed account is given of the methods used to fabricate the plates, the thermal evaporation in vacuum process of forming the metallic resistive film, and a brief discussion of the means for checking the per square resistance of some types of completed plates. Contract no. W28-099-ac-197. Report R-227-49. PIB 172.

Transistorized wrist-radio. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. Jan 1954. 3p diagr Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 111461

1. Radio receivers - Miniaturization 2. Transistors - Uses.

Two D. C. bridges for bolometer power measurements, by Herbert J. Carlin and Eugene Torgow. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. Jun 1951.

15p diagrs, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115158

Two laboratory models of equal arm d.c. Wheatstone bridges circuits for use with r.f. bolometer power meters are described. These bridges, while lacking the convenience of direct reading bridge circuits, are easily designed and constructed as breadboard models, and can therefore be readily modified to accommodate bolometer elements of different resistance values. They are simple to operate and yield rapid and accurate power measurements. Report R-248-51. Contract no. W28-099-ac-503. PIB 189.

Miscellaneous

Design of cyclotron magnets, by Martyn H. Foss. Carnegie Institute of Technology. Dept. of Physics, Pittsburgh, Pa. Jun 1948. 154p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.25, Photocopy $20.25. PB 114984

Contract N7-onr-303, Task order I. Thesis - Carnegie Institute of Technology.
1. Cyclotrons - Magnets - Design 2. Magnetic fields - Measurement 3. Magnetic fields - Mathematical analysis 4. Magnets, Three dimensional - Mathematical analysis 5. Coils - Magnetic field.

Double-beam waveguide arrays, by H. Gruenberg. National Research Council of Canada. Radio and Electrical Engineering Division. Apr 1954. 10p diagrs, graphs Available from National Research Council, Ottawa 2, Canada. $.25. PB 115027

In a practical radar application it was required to design a slotted waveguide array with a radiation pattern containing two, and only two, identical beams making equal and opposite angles with the array normal. It is shown that this is possible, but only for a restricted range of squint angles. NRCC 3337. NRCC ERA 269.

Excitation of an aircraft wing by means of a coupling loop antenna, by J. Y. Wong. National Research Council of Canada. Radio and Electrical Engineering Division. Apr 1954. 14p diagrs, graph Available from National Research Council, Ottawa 2, Canada. $.25. PB 115028

In this report an attempt is made to provide a partial explanation of the mechanism of operation by considering the system as an electromagnetic diffraction problem. Expressions are derived for the effective height of the coupling loop, and quantitative results are included to show the variation of the effective height with cylinder shape. NRCC 3339. NRCC ERA 270.

Gap problem in antenna theory, by Ronold King. Harvard University. Cruft Laboratory. Dec 1953. 21p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D.C. Microfilm $2.25, Photocopy $4.00. PB 115166

The so-called gap problem in antenna theory is considered critically. It is shown that whereas there exist problems related to transmission-line end-effect and coupling between antenna and line, there is no gap, and hence no gap problem, when a physically realizable complete transmitting system is considered rather than an antenna with a fictitious mathematically convenient driving mechanism. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 194.

Linear coupling amplifier, by William G. Long, Jr. U. S. Naval Research Laboratory. Aug 1954. 27p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115138

The two primary purposes of the receiver multicoupler investigation are to establish the relationships existing between the parameters of a multicoupler and the individual circuit variables, and to develop standard methods and techniques for evaluating the performance of a multicoupler. From the information obtained from this investigation, the limitations and optimum performance of a multicoupler can be determined, and comparison of existing units will be simplified. NRL R 4396.

Motion of electrons in two combined magnetic fields, by Sven Gösta Nilsson. Sweden. Kungl. Tekniska Högskolan, Stockholm. 1953. 22p diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115061

Acta polytechnica 137 (1954) Electrical engineering series vol. 5, no. 5. Also published as Kungliga Tekniska Högskolans Handlingar nr. 72.
1. Equations of motion - Sweden 2. Electrons - Motion - Theory - Sweden 3. Electrons - Magnetic moments - Sweden.

Progress report no. XIV, June to Dec 1953. Massachusetts Institute of Technology. Laboratory for Insulation Research. Dec 1953. 85p drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 114956

O.N.R. Contracts N5ori-07801, N5ori-07858.
1. Spectroscopy, Dielectric 2. Ferromagnetism - Research 3. Magnetite - Properties 4. Dielectric research 5. Barium titanate - Spectrographic analysis 6. Crystals, Barium titanate - Stress analysis 7. Crystals - Growth 8. Molecules - Collisions 9. Magnetometers - Design 10. Radio waves - Absorption - Measuring equipment.

Simple microwave power bridge employing a calibrated decade box, by Leonard Sweet. Polytechnic

Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. Jul 1952. 7p diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115161

A bridge which uses a calibrated decade resistance box to measure microwave power is described. The precision and accuracy of the device are analyzed. The unit is extremely simple to assemble and put into operation. Report R-274-52. Contract no. AF-30(604)-18. PIB 213.

Study of the earth's electrical field. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Under Contract no. AF 19(122)-467, by David H. Garber. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Ninth quarterly report for period May 1, 1953 to Jul 31, 1953. Nov 1953. 12p photos, drawing, diagr Microfilm $2.00, Photocopy $2.75. PB 115167

1. Terrestrial magnetism - Measurement 2. Atmosphere - Electricity - Measuring equipment 3. Instruments, Measuring - Magnetic 4. Instruments, Meteorological 5. CAL RA-764-P-9.

Eleventh quarterly report for period Nov 1, 1953 to Jan 31, 1954. Mar 1954. 9p diagr Microfilm $1.50, Photocopy $1.50. PB 115168

1. Terrestrial magnetism - Measurement 2. Recorders, Wind direction - Design 3. Instruments, Measuring - Magnetic 4. CAL RA-764-P-11.

Twelfth quarterly report for period Feb 1, 1954 to Apr 30, 1954. May 1954. 6p Microfilm $1.50, Photocopy $1.50. PB 115169

1. Terrestrial magnetism - Measurement 2. CAL RA-764-P-12.

Survey of phase changers used in the microwave region, by Helen M. Altschuler. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. Aug 1948. 20p drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115156

The purpose of this report is to set forth the various major methods of achieving a phase shift in the form of a survey of the work already accomplished in this field. Results are given qualitatively. Report R-175-48. Contract no. W-33-038-ac-18115. PIB 20.

Use of positive keep-alive voltage with the 1B27 TR tube, by John L. Carter and Irving Reingold. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. Jun 1954. 6p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115255

A study of effectiveness and operational characteristics of the 1B27 TR tube to aid in design: of deep boxing systems for guided missile and beacon applications. Dept. of the Army project no. 3-19-03-032. Signal Corps project no. 323B. SCEL TM M-1587.

Waveguide circuit theory: Coupling of waveguides by apertures, by Nathan Marcuvitz. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. 1947. 84p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 115154

Network parameters that characterize several typical wave-guide structures are determined theoretically, particularly equivalent circuit parameters that describe the coupling of various types of wave guide by apertures of circular, elliptical, and slit shapes. The transmission line and associated mode description of the uniform wave guides is developed in the presence of both transverse and longitudinal discontinuities. The introduction of voltage and current to describe the dominant mode in a wave guide permits the development of a "Kirchoff analysis" of general wave guide structures in terms of network equations characterized by an impedance or admittance matrix. The dependence of the values of the impedance elements on the choice of terminal planes is discussed. Report R-157-47. Report originated at M. I. T. Radiation Laboratory under OSRD sponsorship, and was completed under Contract W28-099-ac-146. PIB 106.

FUELS AND LUBRICANTS

Aircraft material specification: High temperature grease. Gt. Brit. Ministry of Supply. Feb 1954. 6p drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 114955

1. Greases, High temperature - Specifications 2. MS DTD MS 878.

Betrieb-vorschrift für den acetylenbrenner. I: Anfahren des acetylenbrenners, nummern f, zweig 2 (Working instructions for the acetylene distiller. I: Starting the acetylene burner, no. f, sec. 2). I. G. Farbenindustrie, A. G., Oppau, Ger. Oct 1942. 11f table (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Enlargement Print $4.00. PB 115146

1. Acetylene - Distillation - Germany 2. Distillation - Apparatus - Germany 3. Micro BIOS FD 11/47 frames 24000065-75.

Effects of chemically active additives on boundary lubrication of steel by silicones, by S. F. Murray

and Robert L. Johnson. U. S. National Advisory Committee for Aeronautics. Aug 1954. 24p photos, diagr, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115039

Conventional chemically active additives and more active compounds such as peroxide were investigated. Conventional additives were not effective, but more active materials such as the peroxide did give effective lubrication. However, all the chemically active-type additives were inferior to the solvent-type additions. NACA TN 3257.

Increased thermal efficiency of solid fuel through gasification: Technical progress in the U. S. A. and in Europe. Organisation for European Economic Cooperation, Paris. Feb 1954. 100p drawings, diagrs, tables Available from Organisation for European Economic Cooperation, Publications Office, 2002 P Street, N. W., Washington 6, D. C. $1.50. PB 115153

1. Fuels, Solid - Gasification 2. Gasification - Apparatus 3. OEEC TAR PRA/CR/WP 3(53)1.

Isolation of vanadium porphyrins from crude Venezuelan lagunillas oil, by C. C. Overberger and Isidore Danishefsky. Polytechnic Institute of Brooklyn. Jul 1952. 27p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115265

Technical report II under Contract N6onr-263, T/O IV, NR 057-089.
1. Lagunillas oil - Purification 2. Petroleum - Vanadium content 3. Porphyrin - Infrared absorption 4. Porphyrin - Ultraviolet absorption 5. Porphyrin - Purification 6. Vanadium - Recovery from petroleum.

Lösungsmittel für acetylen (Solvent for acetylene), by Holdermann. I. G. Farbenindustrie, A. G., Oppau, Ger. Jul 1943. 3f (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Enlargement Print $1.75. PB 115147

Includes Neues aus der acetylen-und kohlen-oxyd chemie, by Reppe. TEA sitzung 26-9-44.
1. Acetylene - Solvents - Germany 2. Carbon monoxide - Chemical properties - Germany 3. Acetylene chemistry - Germany 4. Micro BIOS FD 15/47, frames 1-3.

Production of transformer oil by hydrogenation of Swedish shale oil, by Ben Braae. Royal Swedish Academy of Engineering Sciences. 1954. 80p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25,D. C. Microfilm $3.75, Photocopy $10.25. PB 115060

Appreciably better hydrogen absorption was obtained when using catalysts produced on the basis of molybdenum and tungsten. Continuous hydrogenation experiments on a small scale showed that hydrogenated products, could be obtained when using fixed contacts produced by shaping and pressing of active molybdenum compounds. Comparative ageing trials in transformers showed that the transformer oil produced from hydrogenated shale oil was comparable in all the more important respects with and equally good as oils produced from mineral oil. Acta polytechnica 136 (1954) Chemistry including metallurgy series vol. 3, no. 9. Also published as Ingeniörsvetenskapsakademiens Handlingar nr. 211.

Report of the Fuel Research Board with the report of the Director of Fuel Research for the year 1953. Gt. Brit. Dept. of Scientific and Industrial Research. Fuel Research Board. 1954. 71p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 115197

S. O. code no. 47-10-0-53.
1. Fuel - Research - Gt. Brit. 2. Coal - Carbonization - Gt. Brit. 3. Coal - Gasification - Gt. Brit. 4. Fischer-Tropsch process - Gt. Brit.

Washability studies of four Virginia coals, compiled by Carl Shelton, Jr. Virginia. Engineering Experiment Station, Blacksburg, Va. Jul 1954. 39p map, diagrs, graphs, tables Available from Virginia Polytechnic Institute, Blacksburg, Va. $.25. PB 115113

Bulletin of the Virginia Polytechnic Institute, Vol. XLVII, no. 9.
1. Coal - Washing 2. V EES B 94.

HIGHWAYS AND BRIDGES

Design of flexible pavements. Presented at the thirty-third annual meeting, January 12-15, 1954. Highway Research Board. 1954. 82p photos, drawings, diagrs, graphs, tables Available from Highway Research Board, 2101 Constitution Ave., N. W., Washington 25, D. C. $1.05. PB 115114

Contents: Triaxial tests in analysis of flexible pavements, by Chester McDowell. - Flexible-pavement design as revised for heavy traffic, by L. D. Hicks. - Flexible-pavement design by the group-index method, by W. C. Davis and W. G. Jones. - Modified C.B.R. flexible-pavement design, by D. J. Olinger. - Designing flexible pavements (Virginia), by D. D. Woodson. - Flexible-pavement design correlated with road performance, by Delbert L. Lacey.
1. Pavements, Flexible - Design 2. Pavements, Flexible - Tests 3. Soils - Compaction 4. HRB RR 16-B 5. NRC 321.

INSTRUMENTS

Automatic digital computation: Proceedings of a symposium held at the National Physical Labora-

tory on March 25, 26, 27 & 28, 1953. International Symposium on Automatic Digital Computation, 3d, Teddington, England, 1953. 1954. 296p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $4.75. PB 115129

S. O. code no. 48-126. Contents: Opening address, by D. R. Hartree. - British machines: 1. The Pilot ACE, by J. H. Wilkinson. - 2. The EDSAC, by M. V. Wilkes. - 3. Operating and engineering experience gained with LEO, by J. M. M. Pinkerton. - 4. MADAM, by F. C. Williams. - 5. MOSAIC, the "Ministry of Supply automatic computer," by A. W. M. Coombs. - 6. NICHOLAS, by N. D. Hill. - 7. Advance notes on RASCAL, by E. J. Petherick. - 8. The TRE high-speed digital computer, by R. H. A. Carter. - Programming: 9. Optimum coding, by G. G. Alway. - 10. Microprogramming and the choice of order code, by J. B. Stringer. - 11. Conversion routines, by E. N. Mutch and S. Gill. - 12. Getting programmes right, by S. Gill. - Design: 13. Special requirements for commercial or administrative applications, by T. R. Thompson. - 14. Input and output, by D. W. Davies. - 15. Echelon storage systems, by D. O. Clayden. - 16. Serial digital adders for a variable radix of notation, by R. Townsend. - The utilization of computing machines, I: 17. Mathematics and computing, by A. van Wijngaarden. - 18. Linear algebra on the pilot ACE, by J. H. Wilkinson. - 19. Numerical solution of ordinary differential equations, by L. Fox and H. H. Robertson. - 20. Solution of partial differential equations, by N. E. Hoskin. - The utilization of computing machines, II: 21. Mathematical tables, by E. T. Goodwin. - 22. Applications of electronic machines in pure mathematics, by J. C. P. Miller. - 23. Application of automatic computing machines to statistics, by K. D. Tocher. - 24. General discussion on "Machine utilization." - Circuitry and hardware: 25. Gates and trigger circuits, by W. W. Chandler. - 25a. Parallel ferroresonant triggers, by J. Garcia Santesmases. - 26. Mercury delay line storage, by M. A. Wright. - 27. Applications of magnetostriction delay lines, by R. C. Robbins and R. Millership. - 28. Cathode ray tube storage, by T. Kilburn. - 29. Memory studies and other developments at the National Bureau of Standards, by Ralph J. Slutz. - Servicing and maintenance: 30. Preventive or curative maintenance, by E. A. Newman. - 31. Experience with marginal checking and automatic routining of the EDSAC, by M. V. Wilkes, M. Phister, Jr. and S. A. Barton. - 32. Diagnostic programmes, by R. L. Grimsdale. - 33. Component reliability in a computing machine at Manchester University, by A. A. Robinson. - Medium size digital computing machines: 34. The Harwell computer, by E. H. Cooke-Yarborough. - 35. The APE(X) C: A low cost electronic calculator, by A. D. Booth. - 36. The Elliott-NRDC Computer 401, a demonstration of computer engineering by packaged unit construction, by W. S. Elliott, H. G. Carpenter, and A. St. Johnston. - 37. Medium-size decimal computing machine, by N. Kitz. - 38. Design requirements of a low-cost computing machine, by K. D. Tocher. - Appendices: I. Alphabetical list of organizations represented and their delegates. - II. Alphabetical list of delegates.

Automatic power monitor, by Edward C. Scott. U. S. Air Force. Air Research and Development Command. Rome Air Development Center, Griffiss Air Force Base, Rome, N. Y. Jul 1954. 20p photos, diagrs (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115257

Development of a reliable compact automatic power monitor is now complete. This item is capable of giving a continuous and accurate indication of power level. It is recommended as a built-in component of radar sets operating in the range of 500 to 10,000 megacycles per second. Adaptation to other ranges is possible. AAF RADC TR 54-38.

Axial focusing magnetic beta-ray spectrometer of high luminosity, resolving power and precision, with proton-resonance-stabilized homogeneous field (without iron) comprising the theory, design, construction, and tests of the new instrument, by Jesse W. M. DuMond, Louis Bogart, James L. Kohl, David E. Muller and James R. Wilts. California Institute of Technology. Norman Bridge Laboratory of Physics, Pasadena, Calif. Mar 1952. 99p photos, drawings, diagrs, graphs (1 fold) tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photocopy $12.75. PB 115191

Special technical report no. 16 on Contract no. N6-onr-244, T. O. IV, NR 017-602: Fundamental research in spectroscopy of short wave-length X-rays and gamma-rays. Appendix I. Magnetic field stabilizing equipment. - Appendix II. Helmholtz coils for removing the earth's field.
1. Spectrometers, Beta ray - Design 2. Spectrometers, Beta ray - Theory 3. Spectrometers, Beta ray - Tests 4. Magnetic fields - Stabilization - Equipment 5. Resonators, Helmholtz.

Computer components fellowship no. 347. Quarterly report no. 2, second series Jan 1, 1954 to Mar 31, 1954, under Contract CLN AF 19(604)943, by J. R. Bowman, F. A. Schwertz, M. N. Haller, A. Milch, B. Moffat, R. T. Steinback, J. J. Mazenko. Mellon Institute of Industrial Research, Pittsburgh, Pa. 1954. 105p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photocopy $14.00. PB 114976

Contents: Sec. I. Electroluminescence. - Sec. II. Nonlinear resistor switching matrices. - Sec. III. Bistable optical elements. - Sec IV. Printed circuitry via xerography. - Sec. V. Saturable transformers as gates. - Sec. VI. Conductive glass resistors.
1. Computers, Digital - Components 2. Resistors, Glass - Use in digital computers 3. Electroluminescence 4. Circuits, Electronic - Printed 5. Electrophotography 6. Transformers, Saturable - Use as gates 7. Light - Sources 8. Stannic chloride - Reactions 9. Vacuum systems - Design.

Difference frequency meter, by B. E. Bourne. National Research Council of Canada. Radio and Electrical Engineering Division. May 1954. 6p

photos, diagr Available from National Research Council of Canada, Ottawa, Canada. $.10.
PB 115292

A method of comparing two frequencies and determining the difference and the higher of the two is described. The report deals with frequencies in the range from zero to approximately 5000 cycles. The frequency comparison is made on a digital basis and is measured by an analog method for presentation on a meter. NRCC ERB 334. NRCC 3314.

Experimental study evaluating structure-borne and air-borne vibrations. Engineering report no. 6 under Contract N7onr-32904, Project NR-264-003, by Chester A. Arents. Illinois Institute of Technology. Dept. of Mechanical Engineering. Dec 1953. 43p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50.
PB 114929

1. Vibration - Measurement 2. Vibration - Measuring equipment 3. Sound, Underwater - Transmission - Research 4. Mountings, Vibration.

Factors affecting the precision and accuracy of an absolute noise thermometer, by E. Walters Hogue. U. S. National Bureau of Standards. Jul 1954. 64p diagrs, graphs (part fold) Available from National Bureau of Standards, Washington 25, D. C.
PB 115254

An evaluation of the principal factors affecting the precision and accuracy of an absolute thermometer, which uses thermally generated noise in conductors as a measure of temperature. Theoretical discussion of the limiting sensitivity of electrical measuring circuitry: the basic design of the apparatus and the calculation of precision to be expected. NBS 3471.

Full-wave detection of signals in noise, by Noel Stone and David Middleton. Harvard University. Cruft Laboratory. Aug 1953. 84p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 115164

The experimental background for the theoretical problems to be investigated is first reviewed, and then a brief sketch of the classical detection problem is included. A signal-to-noise ratio is defined, and the principle results of the study are summarized and discussed in some detail, with the important quantities in the derivation of the output signal-to-noise ratio after full-wave rectification, for input background noise of gaussian statistics, being obtained from the correlation function for the output. Contract N5-ori-76, Task order I, NR-078-011. HU CL TR 182.

Interim report on the Naval Research Laboratory high-current photomultiplier, by J. D. Shipman, M. R. McCraven, and R. V. Talbot. U. S. Naval Research Laboratory. Jul 1954. 13p photos, drawings, graph Available from Library of Congress, Publication Board Project, Washington 25, D.C. Microfilm $2.00, Photocopy $2.75. PB 115234

By the use of extended electrodes and special final dynode and collector geometries it has been possible to provide sufficient output current to drive low impedance coaxial lines to the level required to drive a cathode-ray tube directly. Present work is directed toward the construction of a number of similar tubes having improved characteristics. NRL R 4404.

Microwave Q meter study, by Max Sucher. Polytechnic Institute of Brooklyn. Microwave Research Institute. Dec 1952. 17p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115126

Two methods are described which are particularly suitable for measuring the Q of echo boxes. The relative merits of the two methods are briefly discussed at the end of the report. Contract no. AF 30(120)-490, Task no. 13. Research report R-295-52. PIB 234.

Numerical analysis. Progress report no. 8, Jul 1, 1953 to Dec 31, 1953, under Contract N6ori-07130, NR 044 001, by J. P. Nash. Illinois. University. Digital Computer Laboratory, Urbana, Ill. Dec 1953. 4p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 114939

1. Computers, Digital 2. ILLIAC (Digital computer).

Precision water level recorder for small-scale hydraulic models, by Robert G. Paquette and John H. Lincoln. Washington. University. Dept. of Oceanography, Setalle, Wash. May 1954. 10p drawing, diagr, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 114971

Technical report no. 32. Contract N8onr-520/111, Project NR 083 012.
1. Recorders, Water level - Design 2. Tides - Depth - Measurement 3. Instruments, Oceanographic - Design 4. WU OR 54-18.

Radio-frequency accelerating system for the Cornell 1-bev synchrotron, by P. R. Shifflett, J. Brotzman, and R. V. Talbot. U. S. Naval Research Laboratory. Aug 1954. 72p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115204

This report describes the design and development of an rf oscillator and modulator system for use with an electron synchrotron. The effects of a large beam charge on the cavity, and hence on the oscillator, are discussed. The characteristics of various coupling methods are presented. Operating and maintenance procedures are given. NRL R4419.

Ratio quantizer, by A. M. King, J. T. McLane, and C. G. Myers. U. S. Naval Research Laboratory. Jan 1953. 61p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 115041

A new computing circuit has been developed which performs both the function of division and that of analog-to-digital conversion and possesses high inherent accuracy without requiring the precise adjustment or matching of any component values. The inputs to the circuit are the two voltages representing the ratio to be calculated, and the output consists of two trains of pulses. The relative number of pulses counted at the two outputs over a given length of time represent the ratio in digital form, and the theoretical accuracy with which these counts may define the ratio is limited only by the size of the totals accumulated before the digital division is performed. NRL R 4085.

Volumetric glassware, scientific aspects of design and accuracy. Gt. Brit. National Physical Laboratory. 1954. 24p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 115131

S. O. code no. 48-120-6.
1. Volume - Measuring equipment - Standardization - Gt. Brit. 2. Glassware, Laboratory - Standards - Gt. Brit. 3. Instruments, Measuring - Glass - Standardization - Gt. Brit. 4. NPL NAS 6.

LUMBER AND WOOD PRODUCTS

Extraction and purification of the wood preservative constituent of osage orange, by Roderick A. Barnes. Rutgers University. School of Chemistry, New Brunswick, N. J. Nov 1953. 18p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111458

Contract Nonr-632(00), Project NR 356-291.
1. Toxylon pomifera 2. Stilbene, 2, 4, 3', 5' - Tetrahydroxy 3. Wood - Extractives.

Prevention of decay of wood in boats, by J. G. Savory, with a contribution on electrochemical attack, by D. F. Packman. Gt. Brit. Dept. of Scientific and Industrial Research. Forest Products Research Board. 1954. 32p photos, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 115130

S. O. code 47-68-31.
1. Wood - Decay 2. Wood - Preservatives - Use - Gt. Brit. 3. Wood - Electrochemical deterioration - Gt. Brit. 4. Metals - Electrochemical properties - Gt. Brit. 5. Hulls, Wooden - Decay - Gt. Brit. 6. DSIR FPR 31.

Report of the Forest Products Research Board with the Report of the Director of Forest Products Research for the year 1953. Gt. Brit. Dept. of Scientific and Industrial Research. Forest Products Research Board. 1954. 76p photos, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 115002

S. O. code no. 47-74-0-53.
1. Forests and forestry - Research - Gt. Brit. 2. Woodworking - Research - Gt. Brit. 3. Wood - Research - Gt. Brit.

MACHINERY

Case study data on productivity and factory performance: Fertilizer. U. S. Bureau of Labor Statistics. May 1954. 73p photos, drawings, graph, tables Available from U. S. Bureau of Labor Statistics, Washington 25, D. C. PB 115051

Prepared for the Foreign Operations Administration, Industrial and Technical Assistance Division.
1. Fertilizers and manures - Manufacture 2. BLS R 63.

Case study data on productivity and factory performance: Irons, hot plates and space heaters (Electrically operated). U. S. Bureau of Labor Statistics. May 1954. 213p photos, drawings, diagr, graph, tables Available from U. S. Bureau of Labor Statistics, Washington 25, D. C. PB 115050

Prepared for the Foreign Operations Administration, Industrial and Technical Assistance Division.
1. Irons, Electric - Manufacture 2. Plates, Hot - Manufacture 3. Heaters, Electric - Manufacture 4. BLS R 61.

Cutting speed for a given tool life versus depth of cut when shaping titanium with high-speed-steel tools, by L. V. Colwell and R. E. McKee. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Apr 1953. 28p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111475

The objectives of the tests reported were to determine the sensitivity to depth of cut and cutting speed for a given tool life, when shaping titanium and its alloys. Only high-speed-steel tools were used for the tests. Report no. 9. Contract no. DA-20-018-ORD-11918. Project M993. WAL R401/109-9.

Determination of a safety allowance, by C. Tompkins. Engineering Research Associates, Inc., Arlington, Va. Aug 1949. 7p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115195

Contract N6onr-24001.
1. Supplies - Scheduling 2. Engines - Parts - Stock piles.

Flow and rotating channels, a pictorial review. California Institute of Technology. Hydrodynamics Laboratory, Pasadena, Calif. May 1949. 14p photos, drawing, diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115283

Contract N6onr-244, Task order II, Project NR 062-010.
1. Water tunnels - Equipment 2. Pumps, Centrifugal - Design 3. Impellers, Centrifugal - Design.

Machining studies by radiometric methods, by Francis J. Daasch, Stanley L. Eisler, and W. Dennis McHenry. U. S. Arsenal, Rock Island, Ill. May 1954. 25p photos, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111473

Wear studies by radiometric methods were conducted with both high-speed steel and carbide cutting tools when machining two different compositions of annealed work material, FS4340 and FS86B45. In this investigation, wear studies were also made under various speed and feed conditions with two work materials (FS4340 and FS86B45) and two types of tool material (18-4-1 high-speed steel and carbide). Report no. 4. RIAL R 54-1752.

Reducing tool and tool service costs with a tool loan receipt system, by C. A. Horst. Virginia. Engineering Experiment Station, Blacksburg, Va. Jun 1954. 30p photos, diagrs Available from Virginia Polytechnic Institute, Blacksburg, Va. $.25. PB 115112

Bulletin of the Virginia Polytechnic Institute, Vol. XLVII, no. 8.
1. Tools - Costs 2. Tools - Shop records 3. V EES B 93.

Selected industrial films: Shop practice, machinery and machine tools: A list and description of films available to business from industrial, commercial, and government sources. U. S. Office of Technical Services. Aug 1954. 26p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111361

1. Motion pictures, Educational - Bibliography
2. Machine tools - Motion pictures - Bibliography
3. Machinery - Motion pictures - Bibliography
4. Machine shop practice - Motion pictures - Bibliography 5. OTS SIF 15.

Vortex flow in axial turbo machines, by Jan R. Schnittger. Sweden. Kungl. Tekniska Högskolan, Stockholm. 1954. 61p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 115064

The design problem has been solved by integration of the equation of radial equilibrium in the interspace of the blade rows. Special emphasis is laid on the case of the entrance stages of high capacity axial flow compressors. Examples of this case are worked out and discussed from the aspect of present design practice. Acta polytechnica 142 (1954) Physics and applied mathematics series, vol. 2, no. 9. Also published as Kungliga Tekniska Högskolans Handlingar nr. 14.

Wärmebilanz eines röhren spaltofens zur umsetzung von KW mit H_2O_D (Heat balance of a tubular furnace for double decomposition of hydrocarbon with steam), by Knobloch. I. G. Farbenindustrie A. G., Oppau, Ger. Dec 1941. 6f drawing, tables (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Enlargement Print $2.75. PB 115145

1. Furnaces, Tubular - Design - Germany 2. Hydrocarbons - Cracking - Germany 3. Micro BIOS FD7/47, frames 180000097-102.

MEDICAL RESEARCH AND PRACTICE

Effects of air transportation on various clinical conditions: Reactions of psychiatric patients to air transportation, by Benjamin A. Strickland, Jr., and Charles Ferris. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. May 1954. 9p diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115173

The preparation and handling of psychiatric patients being transported by air are discussed. The major diagnostic groups among the psychiatric cases are tabulated and the incidence of symptoms is given. AAF SAM Proj 21-40-002, Report no. 4.

Mechanisms of altitude adaptation: The effect of adrenalectomy on cardiac output of parabiotic and single rats, by Bernhard Hoelscher. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1954. 10p photo, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115296

A comparative study of the effect of adrenalectomy on parabiotic and single rats was made. These findings are interpreted with respect to the existence of a parabiotic barrier for the transmission through the anastomosis of adrenal steroids. AAF SAM Proj 21-1201-0001, Report no. 7.

Method for estimating toxicity limitation on selection of candidate fire extinguishing agents, by Stephen Krop. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Jul 1953. 10p tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111412

Project no. 4-61-14-002.
1. Fire extinguishers - Toxicity 2. Carbon dioxide - Toxicity 3. Carbon tetrachloride - Toxicity 4. Methane, Bromo - Toxicity 5. Methane, Bromochloro - Toxicity 6. Methane, Bromotrifluoro - Toxicity 7. Methane, Dibromodifluoro - Toxicity 8. CC MD SR 26.

Nervous control of shivering, a shivering suppressor mechanism of the brain stem, by Allan Hemingway, Paul Forgrave and Lucy Birzis. U. S. Air Force. Arctic Aeromedical Laboratory, Ladd Air Force Base, Alaska. Jun 1954. 25p drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115089

The main part of the investigation has consisted of a mapping of the points in the brain stem from which shivering suppression can be evoked by electrical stimulation. Electromyograms, graphs and tables are included. Bibliography attached. Contract no. AF 19(600)-358. AAF SAM Proj 22-1301-0009, Report no. 1.

Relationship between pH and the activity of cholinesterase from flies, by Leigh E. Chadwick, J. Byron Lovell, Virginia E. Egner. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Apr 1953. 17p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115092

Data covered are: Historical and theoretical, and experimental. Results are given accompanied by tables and graphs. Bibliography attached. CMLRE-ML-52. Project no. 4-65-20-001. CC MD RR 181.

Some aspects of the mechanism of respiratory failure in diisopropyl fluorophosphate poisoning in dogs, by Barnett Berman, with the technical assistance of Thomas F. Young, Matthew Asbornsen, Grace Reed. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Apr 1953. 33p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115093

Phenomena concerned with respiration were studied in anesthetized dogs given intravenous DFP by simultaneously recording intrapleural pressures, tidal and minute ventilation volumes, the electrocardiogram, and the electrical activity of four respiratory muscles. Results and conclusions are given. Graphs attached. CMLRE-ML-52. Project no. 4-59-12-007. CC MD RR 182.

Some effects of a lethal dose of X-radiation upon memory: A case history study, by Sylvan J. Kaplan and George Gentry. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1954. 18p photo, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115297

It is concluded that a lethal dose of x-radiation (1,000 r) does not entirely destroy the monkey's memory for a learned task. Manifestations of retention were obtained from between 8 hours following radiation until 21 hours before death. Survival time for the four monkeys studied ranged between 151 and 168 hours. Contract no. AF 18(600)-165. AAF SAM Proj 21-3501-0003, Report no. 2.

METALS AND METAL PRODUCTS

Activation energy for recrystallization in rolled silver, by Krishan K. Tangri and D. S. Eppelsheimer. Missouri. University. School of Mines and Metallurgy, Rolla, Mo. Jun 1954. 19p graphs, tables Available from School of Mines and Metallurgy, University of Missouri, Rolla, Mo. PB 114978

Bulletin, Technical series, no. 83.
1. Silver - Recrystallization.

Additional static and fatigue tests of high-strength aluminum-alloy bolted joints, by E. C. Hartmann, Marshall Holt and I. D. Eaton. U. S. National Advisory Committee for Aeronautics. Jul 1954. 42p photos, drawings, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115012

Static and fatigue tests were made on a few types of joints in 75S-T6, 24S-T4, and 14S-T6 high-strength aluminum-alloy extruded bar. Comparisons are made with the results of earlier tests. For earlier report see NACA TN 2276 (PB 102865). NACA TN 3269.

Brazing titanium to titanium and to mild and stainless steels, by W. J. Lewis, G. E. Faulkner, P. J. Rieppel, C. B. Voldrich. Battelle Memorial Institute, Columbus, Ohio. Dec 1953. 57p photos, diagrs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.50. PB 111434

The brazing characteristics of titanium when joined to titanium, mild steel, and stainless steel were studied. Joints between these materials were induction brazed, torch brazed, and furnace brazed with commercial and experimental brazing alloys. Induction-brazed joints produced higher strengths than furnace- and torch-brazed joints. Joints in titanium were more easily brazed by all methods and using all alloys than those between titanium and mild and stainless steels. High-strength joints in titanium were obtained using titanium-base experimental brazing alloys, but ductility was poor. Contract no. AF 33(038)-23338, RDO 615-20(C-J). Second summary report, Jun 21, 1952 to Nov 21, 1953. For 1st report see PB 111244. AAF WADC TR 52-313, part 2.

Chip formation of titanium, by L. V. Colwell and R. M. Caddell. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jul 1953. 31p photos Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111481

Tests were run on a shaper and a milling machine, the general procedure being to complete the cutting stroke at such a point that a chip would be left intact with the work specimen. Photomicrographs of these chip formation specimens were then obtained, and are presented in this report. Project M 993. Contract DA 20-018-ORD-11918. MU ERI 15. WAL R401/109-15.

Cutting force and surface finish when broaching holes in titanium with high-speed-steel tools, by R. E. McKee and W. W. Gilbert. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. May 1953. 22p photos, drawings, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111499

This report compares the performance of a standard design of internal broach with a similar broach designed as a result of extensive surface broaching tests. It also verifies that titanium alloys could be successfully broached with high-speed-steel broaches. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 24. WAL R401/109-24.

Cutting forces and surface finish when broaching titanium with high-speed-steel tools, by R. E. McKee and W. W. Gilbert. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. May 1953. 16p graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111476s

This report provides results of tests on RC-130A titanium in the surface broaching operation. It may be used for comparisons with the results on Ti-75A, Ti-150A, and RC-130B. Project M993. Contract no. DA 20-018-ORD-11918. MU ERI 28. WAL R401/109-28.

Cutting forces and surface finish when broaching titanium with high-speed tools, by L. V. Colwell and R. E. McKee. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. May 1953. 53p photos, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.75. PB 111476

Project M993. Contract no. DA-20-018-ORD-11918. Ordnance project no. TB4-15.
1. Titanium - Machinability 2. Titanium alloys - Machinability 3. Titanium - Broaching 4. Titanium alloys - Broaching 5. Tools, Cutting - Surface finish 6. Tools, Cutting - Cutting force - Measurement 7. Machines, Broaching 8. MU ERI 10.

Cutting temperature of titanium as compared to steel, by L. V. Colwell and R. M. Caddell. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jul 1953. 8p graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 111482

This report presents the cutting temperatures of titanium and steel as affected by feed and depth of cut, and compares these results with previous data on tool life for the same work materials. Project M993. Contract DA-20-018-ORD-11918. MU ERI 16. WAL R401/109-16.

Deep hole drilling of titanium and its alloys, by W. W. Gilbert and P. R. Visser. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jul 1953. 21p photos, drawings, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111492

The object of this investigation was to determine the feasibility of deep-hole-drilling titanium and its alloys, and to find the optimum cutting conditions. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 21. WAL R401/109-21.

Drilling of titanium and its alloys, by W. W. Gilbert and P. R. Visser. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jul 1953. 40p photos, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25. PB 111490

The object is to obtain force and tool-life data on drilling titanium and its alloys, and to ascertain the best drill design and cutting practice. Torque, thrust and drill-life characteristics were investigated. The effect of cutting fluids was also tested. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 20. WAL R401/109-20.

Effect of side rake angle and size of cut when turning titanium grades Ti-75A and RC-130A with high-speed-steel tools, by L. V. Colwell. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Aug 1953. 46p graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.50. PB 111500

The object of this study was to evaluate the effect of tool side-rake angle and size of cut when turning titanium grades Ti-75A and RC-130A with high-speed-steel tools. Supplement to reports no. 3 and 4 (PB 111297 and 112962). Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 26. WAL R401/109-26.

Exploratory study of the metal bonding of aluminum titanate and of mullite, by Margaret Pausewang. Ohio State University Research Foundation, Columbus, Ohio. Mar 1953. 10p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111436

The good high-temperature properties of mullite are well known, and recent investigations have indicated that stabilized aluminum titanate might make a good ceramic component for a cermet body. This report covers an exploratory study of the metal bonding of these two materials, one of which is an aluminum silicate and the other an aluminum titanate. Contract no. AF 33(616)-3, RDO no. 506-67. AAF WADC TR 53-145.

Face milling titanium; effect of position of cutter and work, by W. W. Gilbert and C. H. Good. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jul 1953. 10p diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50.
PB 111495

This report shows the effect of chip thickness at entrance and exit of the cut on chipping and tool life. The thicknesses will be changed by varying the position of the cutter with respect to the work. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 23B. WAL R401/109-23B.

Face milling titanium; tool-life tests on titanium alloys, by W. W. Gilbert and C. H. Good. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jul 1953. 18p photos, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75.
PB 111497

These tests were made to evaluate the machinability of titanium alloys Ti-75A, RC-130B, Ti-150A, and Ti-150B when face milled using the best cutting conditions. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 23D. WAL R401/109-23D.

Forum on corrosion research. Digests of papers presented at the National Academy of Sciences, November 9 and 10, 1949. 1949. 72p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115046

Contents: Welcoming address, by T. J. Killian. - I. Electrochemical fundamentals: Electrical double layer, by D. C. Grahame. - Metal-solution interface potentials, by D. MacGillavry, Jr. - Polarographic studies of corrosion phenomena, by P. Van Ryssel-berghe. - II. Passivity and inhibitor studies: Electron sharing and the nature of passivity, by H. H. Uhlig. - Passivity studies in stainless steel and other metal systems, by M. G. Fontana. - Passivity exchange adsorption, and inhibitors, by N. Hackerman. - III. Corrosion mechanisms and kinetics: Thermodynamics and mechanisms of corrosion reactions, by D. S. McKinney and J. C. Warner. - Biometallic corrosion in neutral electrolytes, by C. W. Borgmann and R. T. Koenig. - Corrosion of metals in contact with liquids, by G. R. Hill. - Corrosion studies on aluminium and magnesium and their alloys, by W. Beck. - IV. High-temperature corrosion studies: Diffusion mechanisms during oxidation, by M. T. Simnad. - Surface film formation at elevated temperatures, by M. G. Fontana. - Oxidation studies in Fe-Cr alloys, by H. J. Yearian. - Reactions of gases with metals at high temperatures, by D. C. Cubicciotti, Jr. - Corrosion and erosion reactions at elevated temperatures, by W. J. Moore. - Oxidation of metals at elevated temperatures, by H. H. Uhlig.

High-resolution autoradiography, by George C. Towe, Henry J. Gomberg and J. W. Freeman. U. S. National Advisory Committee for Aeronautics. Jul 1954. 140p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115011

This investigation was made to adapt wet-process autoradiography to metallurgical samples to obtain high resolution of segregated radioactive elements in microstructures. The radioactive samples included carbon-14 carburized iron and steel, nickel-63 electroplated samples, a powder product containing nickel-63, and tungsten-185 in N-155 alloy. NACA TN 3209.

Mechanical properties of machinability program work materials, by L. V. Colwell and W. C. Truckenmiller. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jun 1953. 24p photos, drawing, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75.
PB 111296s

Additional tests for physical properties of work materials were made as follows: tensile tests of titanium alloys Ti-130A and Ti-150B; combined compression-torsion tests of titanium alloys Ti-75A, RC-130B, and Ti-150A, type 304 stainless and 1045 steels; tension impact tests on titanium alloys Ti-75A, RC-130A, RC-130B, Ti-150A, and Ti-150B, type 304 stainless and 1045 steels. The results of these tests are presented. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 25. WAL R401/109-25.

Phosphate coating retention during cold extrusion of artillery shells, by Jodie Doss and W. Dennis McHenry. U. S. Arsenal, Rock Island, Ill. Jun 1954. 14p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75.
PB 115180

Steel slugs which had been through the first step of the 105 mm shell extrusion process were prepared for the second step by precleaning, phosphating in a radioactive phosphating bath and applying a lubricating soap film. Counting rates before and after extrusion were determined and the percentage of retained phosphate coating was calculated. Ordnance project no. TB4-302D, Report no. 12. Dept. of the Army project no. 593-14-006. RIAL R54-2086.

Production of sound ductile joints in molybdenum. Fifth progress report for period Jan 30 to July 17, 1953 under Contract no. AF 33(616)-10, by M. I. Jacobson, D. C. Martin, and C. B. Voldrich. Battelle Memorial Institute, Columbus, Ohio.

Jul 1953. 21p photos, drawings, diagrs, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115184

An investigation of the production of sound and ductile welded joints and brazed joints in Mo is presented. A slotted-type tension specimen was developed for determining the shear strength of brazed joints. The results showed that the best noncobalt-base alloy was inconel. The best Co-base alloy was Haynes Alloy 25.

Reaming titanium 75A, 130B, and 150A with high-speed-steel machine reamers, by W. W. Gilbert. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. May 1953. 31p photos, diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111489

The objectives of this study were to investigate the feasibility of reaming titanium alloys Ti-75A, Ti-150A and RC-130B with high-speed-steel machine reamers; to determine the effects of tool angles, cutting fluids, depth of cut, feed rate, and cutting speed on surface finish, power required, reamer condition, and hole size; and to recommend operating conditions for optimum values of surface finish, power required, reamer condition, and hole size. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 19. WAL R401/109-19.

Research and development of metals and alloys for low temperature applications, by Panel on Metals for Use at Low Temperatures. National Research Council. Division of Engineering and Industrial Research. Minerals and Metals Advisory Board. Apr 1954. 77p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $2.00. PB 111453

Chairman: Allen Latham, Jr.
1. Low temperature research 2. Alloys, Ferrous - Effect of low temperature 3. Alloys, Nonferrous - Effect of low temperature 4. Metals - Low temperature 5. Steel - Brittle failure 6. Steel - Low temperature tests 7. MMAB-65-M.

Study of the tangential and normal cutting forces produced when machining titanium, by L. V. Colwell and R. M. Caddell. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jul 1953. 33p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111479

One series of tests was made to investigate the effects of feed, width of cut, and back rake angle on the forces in question. A second group of tests was conducted to find the influence of the cutting velocity on the same two forces. All tests reported were run on a milling machine without the use of cutting fluids. Project M993. Contract DA-20-018-ORD-11918. MU ERI 13. WAL R401/109-13.

Supplemental report on shaping titanium RC-130A and the effect of feed rate and depth of cut on the relationship of speed to tool life, by R. E. McKee and W. W. Gilbert. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jun 1953. 22p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111501

Reports study to determine relative and actual cutting speed for high-speed-steel tools when shaping titanium RC-130A as compared to SAE 1045 steel and the titaniums Ti-75A, RC-130B, and Ti-150A, and to determine the effect of feed and depth of cut on cutting speed. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 27. WAL R401/109-27.

Surface finish of titanium as compared with steel (shaping and turning), by L. V. Colwell and R. M. Caddell. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jun 1953. 31p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111483

One series of tests was performed on a shaper. All conditions were held constant except the feed which was checked at four different rates. Other tests (turning) were made on a lathe. The effects of feed rate and cutting velocity were investigated. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 17. WAL R401/109-17.

Survey of portions of the chromium-cobalt-nickel-molybdenum quaternary system at 1200° C, by Sheldon Paul Rideout and Paul A. Beck. U. S. National Advisory Committee for Aeronautics. 1953. 40p photos, diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.35. PB 115081

Supersedes NACA TN 2683 (PB 106815).
1. University of Notre Dame. Dept. of Metallurgy, Notre Dame, Inc. 2. NACA TN 2683 Revised 3. NACA 1122.

Tapping of titanium and its alloys, by W. W. Gilbert. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Aug 1953. 22p photos, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111484

Project M993. Contract no. DA-20-018-ORD-11918. Ordnance project no. TB 4-15.
1. Titanium - Tapping - Tests 2. Titanium alloys - Tapping - Tests 3. Taps (Tool) - Tests 4. Cutting fluids 5. Tools, Cutting - Life expectancy 6. MU ERI 18 7. WAL R 401/109-18.

Tapping titanium; varying tap design, cutting fluid, cutting speed, and thread depth, by W. W. Gilbert.

Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Aug 1953. 22p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111493

Report no. 22. Project M993. Contract no. DA-20-018-ORD-11918.
1. Titanium - Tapping - Tests 2. Taps (Tool) - Design 3. Tools, Cutting - Cutting speed 4. Cutting fluids 5. WAL R 401/109-22.

Turning titanium with sintered carbide tools, by L. V. Colwell. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jun 1953. 31p graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111480

The purpose of this study was to determine the wear characteristics of carbide tools when used for turning operations on titanium. The variables studied were speed, feed rate, rake angles, and grade of carbide. Project M993. Contract no. DA-20-018-ORD-11918. MU ERI 14. WAL R 401/109-14.

Vibratory compacting of metal and ceramic powders, by W. C. Bell, R. D. Dillender, H. R. Lominac, L. W. Long, E. G. Manning. North Carolina State College. Dept. of Engineering Research, Raleigh, N. C. Apr 1953. 47p drawings, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.50. PB 111435

The scope of this experimental program covers the packing of three non-plastic powders by the use of vibrations in the low, medium and high frequency ranges. The results of packing by these methods were compared with packing of similar powders by hydrostatic pressing. The powders selected for this work were pure alumina, an alumina-chromium cermet and a titanium carbide-nickel cermet. The types of vibration sources used were: mechanical, electrical-mechanical, pneumatic, magnetostrictive, and exponential horn driver units. Contract AF 33-(616)-73, RDO no. 463-7. AAF WADC TR 53-193.

Work hardening of titanium alloys by drilling, by W. W. Gilbert. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jun 1953 20p diagr, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111491

Study investigates the degree and depth of work-hardening of titanium and its alloys as compared with stainless and medium carbon steels when drilling under various conditions. Project M993. Contract no. DA-20-018-ORD-11918. Ordnance project no. TB 4-15. MU ERI 20A. WAL R 401/109-20A.

X-ray diffraction study of zinc phosphate coatings on steel, by James W. McGarvey and Paul G. Chamberlain. U. S. Arsenal, Rock Island, Ill. May 1954. 31p photos, drawing, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111486

Both the tetrahydrate and the dihydrate were studied to determine the causes of the loss of adherence of tertiary zinc phosphate to steel surfaces. Transition studies were made in the change of tetrahydrate to dihydrate at temperatures up to 310°F and under vacuua of 10^{-5} microns of mercury. Further investigation was recommended. Ordnance project no. TB 4-302D, Report no. 11. Dept. of the Army project no. 593-14-006. RIAL R 54-1633.

METEOROLOGY AND CLIMATOLOGY

Auxiliary weather stations in states bordering the Gulf of Mexico, by Guy A. Franceschini and George W. Reynolds. Texas. Agricultural and Mechanical College. Dept. of Oceanography, College Station, Texas. May 1954. 32p maps (1 fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115177

Contract AF 19(604)-169, Scientific report no. 4. A & M Project 44, Reference 54-43T.
1. Weather stations - Gulf of Mexico 2. Meteorology - Gulf of Mexico.

Determination of atmospheric winds and temperature in the 30-60 km region by acoustic means, a study of annual and diurnal variation. Final report under Contract no. AF 19(122)-252, by William B. Kennedy and Lee Brogan. Denver. University. Denver Research Institute, Denver, Colo. Jun 1954. 108p maps, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photocopy $14.00. PB 115015

1. Winds, Chemospheric - Measurement 2. Atmosphere, Upper - Temperature - Measurement 3. Acoustic measurements 4. Chemosphere - Research.

Diffusion and dissociation of molecular oxygen in the atmosphere above 100 km, by P. Mange. Pennsylvania State University. Ionosphere Research Laboratory, State College, Pa. Jun 1954. 69p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 115186

Contract no. AF 19(122)-44.
1. Atmosphere, Upper - Oxygen content 2. Oxygen - Dissociation 3. Ionosphere - Research 4. PSC IRL SR 64.

Essay on development, by Sverre Petterssen. Chicago. University. Dept. of Meteorology. May 1954. 22p map, diagrs, table Available from Library of Congress, Publication Board

Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115021

Contract no. AF 19(604)-390. Technical report no. 3.
1. Cyclones - Development.

Initial value problems in a double Couette flow, by Paul Queney. California. University. Dept. of Meteorology, Los Angeles, Calif. Jan 1954. 118p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photocopy $15.25. PB 115016

Scientific report no. 1 under Contract no. AF 19-(604)-728, Autobarotropic flow project.
1. Couette flow 2. Flow, Barotropic - Theory 3. Fourier analysis 4. Equations, Integral 5. Fresnel integrals 6. Mathematical equations and solutions.

Lunar semi-diurnal oscillation in the ionospheric absorption of 150 kc/s radio waves, by A. P. Mitra. Pennsylvania State University. Ionosphere Research Laboratory, State College, Pa. Jul 1954. 36p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115187

Contract no. AF 19(122)-44.
1. Radio waves - Absorption - Ionosphere 2. Atmosphere, Upper - Ionization 3. Oscillations, Lunar - Effects 4. Ionosphere - D-layer - Absorption - Measurements 5. PSC IRL SR 65.

On periodic barotropic flow patterns whose mean velocity profile is initially sinusoidal, by Leon Sherman. California. University. Dept. of Meteorology, Los Angeles, Calif. May 1954. 20p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115017

This paper considers the doubly two-dimensional flow of a homogeneous inviscid fluid. Such a flow is characterized by a stream function. The initial tilting of these patterns and the flow of kinetic energy between disturbance and zonal current are considered. Then a procedure for the numerical integration of non-steady cases is set up and the errors involved are estimated. As a byproduct a simple means of eliminating an error of the order of 5 to 7% from numerical forecasting procedures is pointed out. Scientific report no. 2 under Contract no. AF 19-(604)-728, Autobarotropic flow project.

On the relations of size and central height to intensity in cyclones at 500 millibars, by Robert B. Des Jardins and Thomas A. Gleeson. Florida. University. Dept. of Meteorology. May 1954. 10p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115013

Scientific report no. 6 under Contract AF 19(122)-466.
1. Cyclones - Intensity - Effect of height 2. Cyclones - Intensity - Effect of size.

Quarterly summary of observations made at Seabrook, New Jersey, Jul 1, 1953 to Sep 30, 1953. Johns Hopkins University. Laboratory of Climatology, Seabrook, N. J. 1953. 29p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115095

Publications in climatology, vol. VI, no. 6. Contract no. AF 19(604)-289.
1. Micrometeorology 2. Climatology 3. Winds - Velocities - Measurement 4. Evapotranspiration.

Report on an experiment with forecasting of cyclone development. Part I: The experiment, by Sverre Petterssen. Part II: The verification, by Gordon E. Dunn and L. L. Means. Chicago. University. Dept. of Meteorology. 1954. 33p diagrs, maps, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115014

Technical report no. 4 under Contract no. AF 19(604)-390.
1. Cyclones - Forecasting 2. U. S. Weather Bureau. District Forecast Center, Chicago, Ill.

Research on atmospheric turbulence and associated diffusion of aerosols and gases near the earth's surface, by H. E. Cramer, G. C. Gill, and F. A. Record. Massachusetts Institute of Technology. Round Hill Field Station, South Dartmouth, Mass. Jun 1954. 7 p photos, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 115019

The ultimate objective of the research program herein described is to achieve an understanding of the basic physical relationships involved in the diffusion of gases and particulate matter in the lower layers of the atmosphere. There are two major subdivisions to the work: an investigation of the structure of atmospheric turbulence with particular emphasis upon evaluation of the intensities and scales of the fluctuations; and, direct measurements of diffusion from a continuous point source by means of suitable tracers and sampling techniques. Final report under Contract no. AF 19(604)-145.

Sky noise measurements. Report no. 10, for the period Jan 1, 1954-Mar 31, 1954, under Contract AF 19(604)-41, by W. M. Protheroe. Ohio State University Research Foundation, Columbus, Ohio. May 1954. 8p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115053

The over-all emphasis of this investigation is currently upon the study of stellar scintillation through the medium of magnetic tape recording of photoelectric observations. Special attention has been given

to studies of the auto-correlation function of the illumination patterns on the telescope objective (shadow-bands). RF Project 480.

Study of certain problems in the field of absorption of microwave energy in the atmosphere. Quarterly progress report IV under Contract AF 19(604)-831 for the period Apr 13, 1954-Jul 12, 1954, by Edwin K. Gora. Providence College, Providence, R. I. Jul 1954. 8p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115056

The evaluation of approximate values for the transition frequencies of ozone in the microwave domain from 0 to 11 cm^{-1} has been completed. The transition frequencies between 0 and 1.5 cm^{-1} have been determined to four decimal places. Attempts have been made to decide which numerical values for the molecular constants fit the experimental data best. An approximation method for the determination of asymmetric rotor intensities has been developed.

To develop empirical objective methods of forecasting surface synoptic features for periods up to 48 hours through the use of upper air and surface parameters. Final report on short range forecasting project under Contract no. AF 19(122)-468, by Joseph J. George, R. D. Roche, H. B. Visscher, R. J. Shafer, P. W. Funke, W. R. Biggers, R. M. Whiting. Eastern Air Lines, Inc. Meteorology Dept., Municipal Airport, Atlanta, Ga. 1954. 9p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115094

This Final Report surveys the project problem, summarizes the solutions, and analyses the applicability and accuracy of the results. Essentially, new and improved methods of forecasting the intensity and behavior of cyclogenesis, cylones, anti-cyclones, cold fronts, warm fronts, and pre-frontal line squalls are presented.

MINERALS AND MINERAL PRODUCTS

Cement och Betonginstitutets verksamhet under tiden 1 Jul 1952-30 Jun 1953. Förestandarens arsredogörelse (Swedish Cement and Concrete Research Institute, Report of the Director for the period 1/7/52-30/6/53). Svenska Forskningsinstitutet för Cement och Betong, Stockholm. 1954. 25p photos, (Text in Swedish) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115034

1. Cements - Research - Sweden 2. Concrete - Research - Sweden 3. Calcium silicates - Research - Sweden 4. Svenska Forskningsinstitutet för Cement och Betong, Meddelanden no. 29.

Experimentell jämförelse mellan lossier-cement och standardcement i cementbruk (Experimental comparison between Lossier-cement and Swedish standard-cement in cement mortar), by Gunnar Lindh. Svenska Forskningsinstitutet för Cement och Betong, Stockholm. 1954. 38p photos, graphs, tables (Text in Swedish) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115036

"Text in English to the figures" stapled in. Summary in English.
1. Tanks, Concrete - Linings - Sweden 2. Cements - Tests - Sweden 3. Cements - Water permeability - Sweden 4. Svenska Forskningsinstitutet för Cement och Betong. Meddelanden nr. 31.

Permeability-porosity relationship for unconsolidated sand, by Robert M. Ponder and Aaron J. Miles. Missouri. University. School of Mines and Metallurgy, Rolla, Mo. Aug 1954. 24p drawing, tables Available from School of Mines and Metallurgy, University of Missouri, Rolla, Mo. PB 114979

Bulletin, Technical series, no. 84.
1. Sands - Permeability 2. Sands - Porosity.

Stability relations of silicate carbonates at elevated temperatures and pressures. First progress report, period Jul 1, 1953 to Dec 31, 1953, under Contract Nonr-656, Task order 6, by R. I. Harper and O. F. Tuttle. Pennsylvania State College. School of Mineral Industries, State College, Pa. Dec 1953. 6p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 114987

Preliminary experiments have been conducted at 30,000 psi on the reaction - calcite and quartz = wollastinite and carbon dioxide.

X-ray examination of the structure of vermiculites, by A. Grudemo. Svenska Forskningsinstitutet för Cement och Betong, Stockholm. 1954. 56p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115033

1. Vermiculite - Crystal structure 2. Vermiculite - X-ray inspection 3. Jefferisite - Crystal structure 4. Jefferisite - X-ray inspection 5. Svenska Forskningsinstitutet för Cement och Betong, Handlingar no. 22.

ORDNANCE AND ACCESSORIES

Compression shock due to the impact of a body on a plane water surface, by L. Trilling. U. S. Naval Ordnance Test Station, Inyokern, Calif. Sep 1950. 26p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114462

Local project 329.
1. Ballistic equations 2. Shock waves - Hydrodynamics 3. Shock waves - Theory 4. Shock waves - Pressure 5. Impact - Theory 6. NOTS TM 808-39.

Determination of limiting broaching angle for water entry of various bodies, by George H. Trilling. U. S. Naval Ordnance Test Station, Inyokern, Calif. Oct 1950. 12p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 114468

Task assignment NOTS-20-Re6a-220-8.
1. Water - Penetration 2. Ballistics, Projectile 3. Ballistics, Underwater - Theory 4. NOTS TM 808-50.

Pressure distribution in the water entry of a flat plate, based upon a straight line wave shape, by George H. Trilling. U. S. Naval Ordnance Test Station, Inyokern, Calif. Oct 1950. 11p diagr, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 114465

Local project 329.
1. Plates, Flat - Pressure distribution 2. Plates, Flat - Hydrodynamics 3. Ballistic equations 4. Water - Penetration - Plates, Flat 5. NOTS TM 808-47.

Pressure distribution on a sphere entering water, based on various linearized-theoretic models, by Robert H. Korkegi. U. S. Naval Ordnance Test Station, Inyokern, Calif. Sep 1950. 28p diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114463

Local project 329.
1. Impact - Theory 2. Spheres - Hydrodynamic - Theory 3. Spheres - Pressure distribution 4. Water - Penetration - Spheres 5. NOTS TM 808-40.

Radiation from a sound source inside a cylindrical shell submerged in an infinite medium, by H. H. Bleich. Columbia University. Dept. of Civil Engineering. Oct 1953. 50p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 114918

The purpose of the paper is the determination of the sound field due to a source inside a cylindrical shell which is submerged in an acoustic medium. Particular attention has been given to the question of resonant frequencies. Numerical results giving typical pressure distributions at large distances were obtained for a lightly stiffened steel shell in water. A detailed study on the effect of rigid diaphragms on the resonant cases was made. Contract Nonr-266(08), Technical report no. 9. CU-9-53ONR-266(08)-CE.

Rotationssymmetrische quellsenkenkörper mit überwiegend konstanter druckverteilung (Axially symmetric source-sink bodies with predominently constant pressure distributions), by H. Münzner and H. Reichardt. Translated by Howard M. Berger and Sanford S. Sweet. U. S. Naval Ordnance Test Station, Inyokern, Calif. Oct 1950. 27p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 40045t

Local project 329.
1. ZWB UM 6616 Translation 2. NOTS TM 808-43.

Splash contours in water entry, III: Oblique entry of cylinders and spheres, by George H. Trilling. U. S. Naval Ordnance Test Station, Inyokern, Calif. Oct 1950. 21p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114467

Local project 329. Parts I-II issued as TM 50-15 and TM 50-16.
1. Water - Penetration - Cylinders 2. Water - Penetration - Spheres 3. Spheres - Hydrodynamics - Theory 4. Cylinders - Hydrodynamics - Theory 5. NOTS TM 808-49.

Study of the convergence of an integral appearing in the theory of water entry of a flat plate, by George H. Trilling. U. S. Naval Ordnance Test Station, Inyokern, Calif. Oct 1950. 12p diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 114466

Local project 329.
1. Plates, Flat - Hydrodynamics 2. Ballistic equations 3. Water - Penetration - Plates, Flat 4. NOTS TM 808-48.

PAPER AND ALLIED PRODUCTS

Development of a new dry type facsimile paper. Final report under Contract N7-onr-330/II, by Homer J. Dana. Washington. State College of Washington. Institute of Technology. Division of Industrial Research, Pullman, Wash. Dec 1951. 20p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115025

Appendix A: Attempt to inscribe by means of supersonic energy. Design of the magneto-striction oscillator. - Appendix B. Inscription by X-rays. - Appendix C. Cathode rays. - Appendix D. Facsimile patents, U. S. and foreign. - Appendix E. Compounds which did not work.

PERSONNEL APTITUDE TESTING

Development and appraisal of a measure of student motivation, by Leslie J. Briggs. U. S. Air Force.

Air Research and Development Command. Air Force Personnel and Training Research Center. Armament Systems Personnel Research Laboratory, Lowry Air Force Base, Colorado. Aug 1954. 23p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115190

Project no. 7709, Task no. 77153. Research bulletin AFPTRC-TR-54-31.
1. Tests, Officer qualification 2. Personnel, Flying - Psychological records 3. Psychological tests 4. AAF PTRC TR 54-31.

Developing problem-solving skills in engineering. Final report under Contract N7-onr-45012, Project NR 151-144, by J. F. Calvert, R. S. Hartenberg, R. A. Kiphardt, H. P. Shelley, and J. Denavit. Northwestern University, Evanston, Ill. Aug 1953. 255p photos, diagrs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $5.00. PB 111449

The purpose of this project was to determine how problem-solving ability may be enhanced through undergraduate training: to assemble suitable educational methods, proposals for their employment, and methods of testing their effectiveness.

Infantry OCS evaluations and combat performance, by Robert V. Katter and Milton G. Holmen. George Washington University. Human Resources Research Office, Washington, D. C. Jun 1954. 12p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115120

1. Tests, Officer qualification 2. Officer candidate school - Qualifications 3. Officer performance record - Evaluation 4. Prediction 5. Psychology, Applied 6. GWU HRRO TR 8.

Methodological study of electronics trouble shooting skill. II: Intercomparisons of the MASTS tests, a job sample test, and ten reference tests administered to fleet electronics technicians, by William W. Grings, Nicholas A. Bond, Jr. and Stanley A. Summers. University of Southern California. Dept. of Psychology, Los Angeles, Calif. Aug 1953. 41p photos, fold diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 115171

The report describes the tests involved in the study, the subject sample, and the procedures followed. Contract Nonr-228(02), Project NR 153-093. Technical report no. 10. For Part I see PB 113940.

Review of literacy training programs in the armed services during World War II, by Nicholas A. Fattu, Edmund Mech, Lloyd S. Standlee. Indiana. University. Institute of Educational Research. Personnel Analysis Division, Lafayette, Ind. Dec 1953. 111p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photocopy $15.25. PB 114937

Contract Nonr-908(01). PA 3018.3.1.
1. Literacy - Training 2. Education, Adult 3. Training - Research 4. Personnel, Military - Education 5. NAVPERS TB 53-4.

Sex differences in problem solving, by Edward J. Sweeney. Stanford University. Dept. of Psychology, Stanford, Calif. Dec 1953. 86p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 114940

Technical report no. 1 under Contract N6 onr 25125 (NR 153-149). Thesis - Stanford University.
1. Ability tests - Effect of sex 2. Mental discrimination - Effect of sex 3. Sex - Effect on mental ability.

Visual characteristics of the submarine population, by Ira Schwartz and N. Elaine Sandberg. U. S. Navy. Medical Research Laboratory, Naval Submarine Base, New London, Conn. Jun 1954. 15p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115198

The visual characteristics of 1064 submarines were determined by means of Snellen wall charts and the Bausch and Lomb Ortho-Rater. Report no. 252, Vol. XIII, no. 12. NMRI Proj NM 003 041.57.02. NAV MRL 252.

PHOTOGRAPHIC AND OPTICAL GOODS

Photographic measures of double stars, by K. Aa. Strand. Northwestern University. Dearborn Observatory, Evanston, Ill. 1954. 32p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115170

Annals of the Dearborn Observatory, vol. VII, Part 1.
1. Stars, Binary - Photographic observations 2. Cameras, Telescopic - Design 3. Films (Photography), Spectroscopic.

Selective essay key for the photoidentification of coastal features and associated settlement patterns in a glaciated New England region, by Clyde F. Kohn and William E. Powers. Northwestern University. Dept. of Geography, Evanston, Ill. n.d. 136p photos, maps, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photocopy $17.75. PB 114975

Technical report no. 6. Contract no. N7 onr-45-005, Project NR 387-005.
1. Coasts - Photoidentification 2. Physical geography - New England 3. Photography, Aerial - New England.

PHYSICS

General

Ad hoc theory of free turbulent jets, by L. G. Alexander. Illinois. Engineering Experiment Station, Urbana, Ill. Aug 1952. 23p diagrs, graph, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114920

Contract N6-ori-71, Task order XI.
1. Flow, Jet-mixing - Theory 2. Flow, Turbulent - Theory 3. Turbulence - Theory 4. Reichardt's theory (Jet flow) 5. ILU EES TR 13.

Analogy between surface waves in a liquid and shocks in compressible gases: Experimental study of wave forms, by H. E. Crossley, Jr. California Institute of Technology. Hydrodynamics Laboratory, Pasadena, Calif. Apr 1949. 15p photo, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 114915

O.N.R. project NR-062-059 and Contract NOrd-9612. Report no. M-54.2.
1. Wave form analysis 2. Waves in water - Effect of detergents 3. Flow, Hydrodynamic - Analogies 4. Shock waves - Velocity - Measurement.

Axially symmetric three-dimensional fluid flow. Final report under Contract no. N7 onr-32905, by V. L. Streeter and Le Van Griffis. Illinois Institute of Technology, Chicago, Ill. Aug 1950. 4p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 114909

Project no. 4955, Report no. 10. For 3d report see PB 114908.
1. Flow, Axially symmetric - Theory 2. Flow, Three-dimensional - Theory.

Dynamics of an ionized medium with applications to systems of ions and electrons in steady motion, Part I, by V. A. Bailey. Pennsylvania State University. Ionosphere Research Laboratory, State College, Pa. May 1954. 83p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 115185

The present study is limited to systems in which the positive particles are all of one kind and move in regions completely separated from those in which the electrons move. Contract no. AF 19(122)-44. PSC IRL SR 62.

Free-streamline analyses of transition flow and jet deflection, edited by John S. McNown and Chia-Shun Yih. Iowa. University. Institute of Hydraulic Research, Iowa City, Iowa. 1953. 86p diagrs, graphs, table Available from Iowa Institute of Hydraulic Research, Iowa City, Iowa. PB 114879

State University of Iowa Studies in Engineering, Bulletin 35. Contents: Elements of free-streamline theory, by John S. McNown. - Transition curves of constant pressure: I. Streamlined streets, by R. Gerber and John S. McNown. - II. Inlets, by D. W. Appel and E. M. Laursen. - Deflection of jets: I. Symmetrically placed V-shaped obstacles, by T. T. Siao and P. B. Hubbard. - II. Symmetrically placed U-shaped obstacles, by Turgut Sarpkaya. - III. Unsymmetrically placed semi-infinite plate, by Simon Ince and Clark De Haven. - Manifold efflux, by Arthur Toch and Robert W. Moorman. - Head losses in miter bends, by Harry H. Ambrose. - References. II HR 427.

Investigation of the flow through a perforated wall, by P. F. Maeder and J. F. Stapelton. Brown University. Division of Engineering, Providence, R. I. May 1953. 24p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114911

The flow through a perforated wall is investigated using a modified form of Tollmien's solution for a free jet. The results of experiments indicate that this type of flow is a mixing phenomenon, and that the Reynolds number is of secondary importance. Technical report WT-10. Contract N7onr-35805.

Kinetische behandlung der keimbildung in übersättigten dämpfen (Kinetic treatment of the nucleation in supersaturated vapors), by R. Becker and W. Döring. Translated by J. Vanier. Sep 1954. 43p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115121

The equations of the individual processes of self nucleation are utilized through an electrical analogy to obtain the nucleation frequency. With the nucleation frequencies of crystals and spheres, the Ostwald law of stages is reviewed and modified. In the final section the general resistance image is discussed and mention is made of the relation of the electrical network and Volmers formula. Translated from Annalen der physik, folge 5, band 24, p. 719-752, 1935. NACA TM 1374.

Lattice dynamics of ice and a case of diffuse X-ray scattering, by E. Forslind. Svenska Forskningsinstitutet för Cement och Betong, Stockholm. 1954. 40p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115032

1. X-rays - Scattering - Sweden 2. Ice - Molecules - Vibration - Theory - Sweden 3. Ice - Thermodynamic properties - Sweden 4. Svenska Forskningsinstitutet för Cement och Betong, Handlingar no. 21.

On the stability of some flows of an ideal fluid with free surfaces, by J. L. Fox and G. W. Morgan. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Dec 1952. 138p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photocopy $17.75. PB 114917

An investigation is made into the stability of four types of two-dimensional free surface flows of an ideal fluid when subjected to small perturbations. A series of orifice flows is investigated, all of whose perturbations are found to be stable with the exception of an isolated unstable perturbation in the case of one member of the series, namely the flow through a Borda mouthpiece. Finally the existence of unstable perturbations is indicated in the case of equal and opposite impinging jets. Contract N7onr-35807. Technical report no. 2. Appendix A. Generalized orifice flow. - Appendix B. Equal and opposite jets. - Appendix C. Finite jet impinging on finite plate. GDAM TR 2.

Rate of growth of vapor bubbles in superheated water, by Paul Dergarabedian. California Institute of Technology. Hydrodynamics Laboratory, Pasadena, Calif. Aug 1952. 23p photos, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114916

These calculations indicate that the values of the bubble radii for which the equilibrium is unstable are restricted to a finite range of radii whose values are governed by the temperature of the water and the initial air content in the bubble. Two theoretical solutions for the rate of growth of these unstable bubbles are considered. Contract N6onr-24420 (NR 062-259). Report no. 21-10.

Simultaneous transport of heat and momentum in a ducted jet, by L. G. Alexander and A. Kivnick. Illinois. Engineering Experiment Station, Urbana, Ill. Aug 1952. 31p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 114919

The method of applying Reichardt's formula for turbulent shearing stress to the flow in a ducted jet was extended to the case of simultaneous transport of heat and momentum. A procedure for determining the most probable value of the "spreading coefficient" was developed. Equations and coefficients so obtained were used to correlate the data. A method was presented for the prediction of energy and momentum flux profiles in the ducted jet, and the experimental results are compared with the predictions. Contract N6-ori-71, T. O. XI. ILU EES TR 12.

Study of acoustic streaming, by Herman Medwin. California. University. Dept. of Physics, Los Angeles, Calif. Dec 1953. 68p photos, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 114941

Contract N6onr-27507, Project NR 014-302. Technical report no. VIII. Appendix A. Streaming caused by a plane progressive wave in a cylindrical tube. - Appendix B. Validity of the attenuation approximation.
1. Vortex motion - Theory 2. Generators, Noise - Design 3. Gas flow - Effect of sound 4. Sound - Vortex effects 5. Sound - Attenuation - Theory 6. Eckart's formula (Reverberation).

Transition probabilities of molecular band systems. University of Western Ontario. Dept. of Physics. Under Contract no. AF 19(122)-470. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

X: An electric-circuit model of the one-dimensional Schroedinger equation, by D. R. Fewer, L. J. Allen, and J. H. Blackwell. Jul 1954. 40p photos, diagrs, graphs, tables Microfilm $2.50, Photocopy $5.25. PB 115007

The model built has itself insufficient inherent accuracy for use in the solution of actual physical problems; the information obtained from the investigation, however, enables a design procedure to be set up so that any desired accuracy may be obtained in the future.

XI: Calculation of overlap intervals and other matrix elements by a simultaneous equations method, by P. A. Fraser. Jul 1954. 12p tables Microfilm $2.00, Photocopy $2.75. PB 115008

Overlap integrals and other matrix elements may be considered as the coefficients in a Fourier type series. If the series may be cut off at a small number of terms to give a certain accuracy, if the value of the series is known at sufficient points, and if the expansion wave functions are also known at this sufficient number of points, then the resulting set of simultaneous equations may be solved for the overlap integrals or other matrix elements. A number of possible checks on the values of matrix elements obtained in this manner are mentioned, and some advantages and disadvantages indicated. Scientific report no. 16.

XII: Approximate calculations of the electronic transition moment, by P. A. Fraser. Jul 1954. 24p diagr, graphs, tables Microfilm $2.25, Photocopy $4.00. PB 115009

Calculations of the electronic transistion moment for the First and Second Positive band systems of Nitrogen are described. Scientific report no. 17.

Ultrasonic propagation in solid materials. Andersen Laboratories, Inc., West Hartford, Conn. Under Contract no. AF 19(604)-835. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Interim research report no. 3, Jan 1, 1954 to Mar 31, 1954, by Sven J. Johnson. Mar 1954. 14p photos Microfilm $2.00, Photocopy $2.75. PB 115096

The application of techniques, developed as a result of the ability to observe and study ultrasonic beams in fused quartz, has led to the production of delay lines of unusual characteristics. Several extremely low attenuation delay lines have been assembled, including some short lines which have yielded as much as 12 db voltage gain from input to output. An improvement in the technique of obtaining beam diffraction photographs yields images which are free of all background light, and which show much greater detail that previous photographs. Several 65 mc/sec. beam photographs are presented, some illustrating the effect upon the radiated beam when various crystal loading techniques are employed.

Final research report (no. 4), from Apr 1, 1954 to Jun 30, 1954, by Sven J. Johnson. Jun 1954. 12p photos, graph Microfilm $2.00, Photocopy $2.75. PB 115097

Additional ultrasonic beam photographs are presented, and certain discoveries are described pertaining to the polarization and rotation of the plane of polarization of light diffracted by an ultrasonic grating. A general summary of the work covered during the period of the contract is included, as there is a section devoted to certain conclusions based upon the work.

Unsteady cavitating flow past curved obstacles, by L. C. Woods. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1953. 9p diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 115132

Cover date is 1954. S. O. code no. 23-9007-49. 1. Cavitation tests - Gt. Brit. 2. Flow, Unsteady - Cavitation - Gt. Brit. 3. ARC CP 149.

Vibrations of a cylindrical tube containing flowing fluid, by Frithiof I. N. Niordson. Sweden. Kungl. Tekniska Högskolan, Stockholm. 1954. 27p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115063

The paper deals with the influence of a fluid inside (or outside) a cylindrical shell on its natural frequencies. The influence of the velocity of the fluid is discussed. Acta polytechnica 139 (1954) Mechanical engineering series, vol. 3, no. 2. Also published as Kungliga Tekniska Högskolans Handlingar nr. 73.

Nuclear

Basic mechanisms in radiobiology. II: Physical and chemical aspects. Proceedings of an informal conference held at Highland Park, Illinois, May 7-9, 1953, edited by John L. Magee, Martin D. Kamen, Robert L. Platzman. National Research Council. Committee on Nuclear Science. Subcommittee on Radiobiology. 1953. 150p diagrs, graphs, tables Available from Publications Office, National Research Council, 2101 Constitution Ave., Washington 25, D. C. $1.00. PB 114991

Publication 305. Contents: I. Initial energy transfer from incident radiation to matter, by Robert L. Platzman. - II. Energy transfer from secondary electrons to matter, by Robert L. Platzman. - III. Mechanisms of energy degradation and chemical change: Effects of secondary electrons, by John L. Magee. - IV. Mechanisms of energy degradation and chemical change: Effects of electronic excitation, by Henry Linschitz. - V. Summary: Importance of radiation chemical effects in radiobiology, by Martin Kamen. - References, p. 123-133.

Dissociation energy of NO and N_2, by Marx Brook and J. Kaplan. California. University. Institute of Geophysics. Jul 1954. 12p photos, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115055

The vibrational levels of the $X^2\pi$ ground state of NO have been observed up to v-23, or an energy of 4.46 e.v. In order that D_0(NO) be 5.29 e.v., a very sharp and sudden drop in the $\Delta G(v)$ values is necessary. No such tendency is observed, and therefore the higher value of D_0(NO)-6.48 e.v. appears most probable. This value then fixes $D_0(N_2)$-9.76 e.v. A new system of NO bands in the near infrared is reported. These are probably due to a 4π —— 4π transition. Scientific report no. 3 under Contract no. AF 19(122)-453.

Exchange studies with complex ions: Exchange and aquation studies with thiocyanate complexes, by Arthur W. Adamson and R. G. Wilkins. University of Southern California. Dept. of Chemistry, Los Angeles, Calif. Nov 1953. 31p diagrs, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111460

Contract N6onr-23809. Presented at the Symposium on Coordination Chemistry, Copenhagen, Aug 1953. 1. Thiocyanates - Exchange reactions 2. Thiocyanates - Aquation 3. Ions - Exchange.

Fast neutron inelastic scattering, by Robert Mitchell Klehn. Massachusetts Institute of Technology. Laboratory for Nuclear Science and Engineering. Dec 1953. 118p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photocopy $15.25. PB 114970

The neutron inelastic scattering cross sections of Fe, Al, Cr, Ni, Pb and Bi have been measured with ~20 kev resolution for neutron energies between 0 and 2.7 Mev. The experimental method also allowed the determination of the first few excited states of the stable nuclei observed. The total neutron cross sections of C, Cl and P have also

been measured in good geometry and with 2 kev resolution for 100 kev $< E_n < 1.2$ Mev. Technical report no. 64. Contract N5ori-07806, NR-026-001. Thesis - Massachusetts Institute of Technology.

Penetrating showers in light and heavy elements, by Joseph G. Askowith and Kurt Sitte. Syracuse University. Institute of Industrial Research. Dept. of Physics. 1954. 26p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115018

Contract no. AF 19(604)-68. Scientific report no. 2.
1. Atomic power - Research 2. Lithium - Nuclear properties 3. Carbon - Nuclear properties 4. Aluminum - Nuclear properties 5. Lead - Nuclear properties 6. Electrons - Showers.

Simple circuit for control of bath temperature, by A. G. White. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Apr 1954. 5p diagr Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 115136

H.D. 1209. S. O. code no. 70-674-1-68.
1. Circuits, Bridge - Design - Gt. Brit. 2. Thermistors - Properties - Gt. Brit. 3. Atomic power - Research - Gt. Brit. 4. Radiochemical laboratories - Equipment - Gt. Brit. 5. AERE C/M 202.

Technical reports no. 114-117 under Contract N6-ori-117, Task order I (Nuclear physics). Washington University. Dept. of Physics, St. Louis, Mo. Dec 1953. 26p diagr, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115108

Contents: No. 114. Transmission of electrons through thin metallic foils, by C. H. Chang, C. S. Cook and H. Primakoff (Reprinted from Physical Review, vol. 90, no. 4, p. 544-547, May 15, 1953). - No. 115. Pseudoscalar interaction in the theory of beta-decay, II, by Tino Ahrens (Reprinted from Physical Review, vol. 90, no. 5, p. 974-977, June 1, 1953). - No. 116. Angular correlation between the first and third gamma rays Tl^{48}, by C. E. Whittle and P. S. Jastram (Reprinted from Physical Review, vol. 92, no. 1, p. 205-206, Oct 1, 1953). - No. 117. Proton-deuteron scattering at 5.1 mev and deuteron-proton scattering at 10.2 mev, by K. B. Mather.

PHYSIOLOGY

Low temperature physiology. Annual report January to December 1953, by M. X. Zarrow. Purdue University. Dept. of Biological Sciences, Lafayette, Ind. Jan 1954. 31p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 114935

Title of project: Effect of prolonged exposure to low temperatures. Contract N7onr-39425, NR 160-201. Contains also abstract reprinted from Anatomical Record, Vol. 117, no. 3, November 1953, pp. 551 entitled Comparison of the effect of prolonged exposure to cold and treatment with cortisone acetate on the circulating eosinophils, M. E. Denison and M. X. Zarrow.

Physiological effects of exposure to altitude and other abnormal environments: The prophylactic value of tocopherol on hypoxia, by I. R. Telford, O. B. Wiswell, E. L. Smith, R. T. Clark, Jr., J. F. Tomashefski, and D. Criscuolo. U. S. Air Force. School of Aviation Medicine, Randolph Field, Tex. May 1954. 10p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115091

Contract no. AF 41(607)39.
1. Altitude, High - Physiological effects 2. Environment - Physiological effects 3. Oxygen deficiency - Therapeutic agents 4. Tocopherol - Uses 5. Vitamin E - Deficiency - Therapeutic agents 6. Texas. University. Dental Branch, Houston, Tex. 7. AAF SAM Proj 21-1201-0013, Report no. 4.

PSYCHOLOGY

Annual report of research supported by the Office of Naval Research. Michigan. University. Institute for Social Research, Ann Arbor, Mich. Dec 1953. 30p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114938

Contract no. N6 onr 232, Task order 2. Contents: Part I. Survey research center. - Part II. Research center for group dynamics.
1. Psychology, Applied 2. Group behavior 3. Psychological research.

BENOX report, an exploratory study of the biological effects of noise. Chicago. University, Chicago, Ill. Dec 1953. 120p photo, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photocopy $15.25. PB 114936

Contract N6ori-020, Task order 44, Project NR 144-079. Contents: I. Recommendations. - II. Introduction, by Hallowell Davis. - III. Survey of the problem, by Hallowell Davis. - IV. Acoustic properties of present day military aircraft, by I. Rudnick. - V. Aural pain produced by sound, by H. E. von Gierke, H. Davis, D. H. Eldredge, and J. D. Hardy. - VI. Hearing losses and protective measures, by W. D. Neff. - VII. Protection of the ear from noise: Limiting factors, by H. E. von Gierke and Darrell R. Brown. - VIII. Communication, by W. D. Neff. - IX. Orientation in space, by Harlow W. Ades. - X. Central nervous system effects, by Arthur A. Ward. - XI. Immediate psychological effects, by W. R. Miles.

XII. Neuropsychological effects of chronic intermittent exposure to noise, by Ward C. Halstead. - XIII. Summary.

First report of the joint committee on human relations in industry, March 1953 to March 1954. Gt. Brit. Dept. of Scientific and Industrial Research and Gt. Brit. Medical Research Council. May 1954. 20p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 115289

S. O. code no. 47-181.
1. Gt. Brit. Medical Research Council 2. Psychology, Applied - Gt. Brit. 3. Labor and laboring classes - Psychological factors - Gt. Brit.

Group Psychology Branch project reports, 1 January 1947-1 January 1953. U. S. Office of Naval Research. Group Psychology Branch. Aug 1953. 20p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115010

1. Psychological research - Bibliography 2. Psychology - Bibliography.

Standard errors of various test statistics when the test items are sampled, by Frederic M. Lord. Educational Testing Service, Inc., Princeton, N. J. Dec 1953. 33p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 114934

Consideration is given to the relation of certain of the standard errors to the conventional standard error of measurement, to the Kuder-Richardson reliability coefficients 20 and 21, and to the Wilks-Votaw criterion for parallel tests. Practical applications of the results are briefly discussed. Contract Nonr-694(00), Project NR 151-113.

Statistical analysis of the parameters of motor learning, by Merrill Roff, Robert B. Payne, and Edwin W. Moore. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Feb 1954. 22p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115090

Correlations among multiple scores obtained from three motor learning situations, and from certain printed tests, were factor analyzed. Learning scores included performance level, rate of change, gain, and variability. AAF SAM Proj 21-0202-0001, Report no. 1.

RUBBER AND RUBBER PRODUCTS

Evaluation of neoprene-GR-S rubber blends, by Paul M. Rogers. U. S. Arsenal, Rock Island, Ill. Jul 1953. 15p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115302

Ten blends of Neoprenes WRT or FR with GR-S (x600) were prepared and evaluated. The blends containing Neoprene WRT were prepared in ratios up to 50 parts GR-S while those blends based on Neoprene FR were prepared in ratios up to 30 parts GR-S (x600). Project no. TB4-521C, Report no. 3. RIAL R 53-2405.

Evaluation of neoprene polymers for ordnance applications, by Z. T. Ossefort. U. S. Arsenal, Rock Island, Ill. Jun 1953. 20p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115303

Evaluation data is noted on neoprene types GN, RT, W, and WRT from the general purpose category and on Types Q, S, and FR from the special purpose group. A short description of the polymers and reasons for evaluation is presented. Results of evaluation of a series of blends of neoprene Type S with other neoprene polymers using high plasticizer concentration (with object of improving the low temperature characteristics of the neoprenes) are presented. Project no. TB4-521C, Report no. 4. RIAL R 53-2448.

Study of reaction of ozone with polybutadiene rubbers. Report no. 6, period 1 Jun 1954 thru 30 Jun 1954, under Contract no. DA-11-022-ORD-329, Supplemental agreement no. 4, Project no. TB 4-521. Augustana Research Foundation. Rock Island, Ill. Jul 1954. 55p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 114988

Covers inhibitors, and antioxidants. Some new formulations tested. Various organic groups tested for ozone absorption. Includes summaries of 1st-5th reports.

Thermodynamics of crystallization in high polymers: Natural rubber, by Donald E. Roberts and Leo Mandelkern. U. S. National Bureau of Standards. Aug 1954. 23p graphs, tables Available from Office of Scientific Publications, National Bureau of Standards, Washington 25, D. C. PB 115042

Project ONR (QMC) NR-330-013. Government order NA-onr-79-49. Technical Report no. 16.
1. Rubber - Crystallization 2. Rubber - Temperature effect 3. Rubber - Melting point 4. NBS 3489.

STRUCTURAL ENGINEERING

Avoiding defects in internal plastering. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, England. Aug 1954. 6p table Available from British In-

formation Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 115290

S. O. code no. 72-22-0-69.
1. Plaster - Defects - Gt. Brit. 2. Plastering - Gt. Brit. 3. DSIR BRD 69.

Bending tests on box beams having solid- and open-construction webs, by Aldie E. Johnson, Jr. U. S. National Advisory Committee for Aeronautics. Aug 1954. 25p drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115139

The results of an exploratory experimental investigation of the effects of replacing alternate webs in a multiweb beam by open, post-stringer construction are reported. Post-stringer (either upright or inclined posts) construction is shown to perform the function of comparable-weight, solid, fabricated webs in the stabilization of the compression cover of a beam in bending both before and after buckling. NACA TN 3231.

Buckling of sandwich cylinders under axial compression, torsion, bending and combined loads, by Chi-Teh Wang and Daniel F. DeSanto. New York University. College of Engineering. Research Division. Aug 1953. 82p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 114910

In this report, the theory of buckling of sandwich cylinders under axial compression, torsion, and bending, and combined loads is developed in a unified manner; and the principal experimental results are presented. The interrelationship obtained between the critical loads is plotted in the form of nondimensional interaction curves. Contract N6-onr-279, Task order V.

Circular plates subjected to radially symmetrical compression or tension in the plane of the plate, by Ove Pettersson. Royal Swedish Academy of Engineering Sciences. 1954. 31p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115062

First, there was treated as a fundamental load case the circular plate elastically restrained along its circumference with transverse load consisting of evenly distributed load over the whole plate. From the results found in this treatment, there is then presented an approximate method of computation. Acta polytechnica 138 (1954) Mechanical engineering series vol. 3, no. 1. Also published as Tekniska skrifter nr. 153.

Damp-proof courses. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, England. 1954. 6p diagr Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 115128

S. O. code no. 72-22-0-68.
1. Building materials - Moisture proofing - Gt. Brit. 2. Floors and flooring - Moisture proofing - Gt. Brit. 3. Walls - Dampness - Treatment - Gt. Brit. 4. DSIR BRD 68.

Deflection of a continuous beam produced by the vertical motion of a support point, by Turner L. Smith. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Dec 1953. 22p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114733

The elastic curve for a uniform continuous beam, simple restrained to have zero deflection at four or more equidistant points, satisfies a second order linear finite difference equation. The general solution for the elastic curve is found to be the sum of a decreasing wave and an increasing wave. By a combination of these, the elastic curve produced by moving any one support point is obtained, including the cases where the support point which is moved is at one end or near one end. These results are useful in obtaining a logical procedure for correcting supersonic nozzles. Project TB3-0118H. Dept. of the Army project no. 503-06-004. APG BRL R888.

Experimental research on cavitation collapse pressures, by John K. Vennard and Claud C. Lomax, Jr. Stanford University. Dept. of Civil Engineering, Stanford, Calif. Dec 1950. 71p photos, fold drawing, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 114914

Conical segments of large spherical cavitives have been allowed to collapse on the end of a steel impact rod at the apex of the cone and the resulting impact pressures deduced from the stress waves produced in the rod. The experimental results show good agreement with available theoretical studies on the subject. Final report prepared under Contract N6-onr-25118 (NR-062-061). Appendix I. References. - Appendix II. Nomenclature. - Appendix III. Photography. - Appendix IV. Electronics, by Lester A. Roberts.

Impact on a multi-span beam, by William H. Hoppmann, 2d. Johns Hopkins University. Dept. of Mechanical Engineering, Baltimore, Md. Sep 1949. 25p diagr, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115324

In this paper a study is made of impact on a continuous beam on four supports. The impact is produced by collision of a solid sphere with the beam at the mid-point of the center span. The spans are of equal length and of constant cross-section. Formulas are obtained for the deflections and strains. A numerical example illustrating the theory is worked out in detail. Contract N6-onr-243, Task order VIII, NR-035-215. Technical report no. 3.

Report of the Building Research Board, with the report of the Director of Building Research for the year 1953. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Board. 1954. 89p table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 115183

S. O. code no. 47-61-0-53.
1. Building - Research - Gt. Brit.

Special investigation to develop a general method for three-dimensional photoelastic stress analysis, by M. M. Frocht and R. Guernsey, Jr. U. S. National Advisory Committee for Aeronautics. 1953. 19p photos, drawings, diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.20. PB 115079

Supersedes NACA TN 2822 (PB 108173).
1. NACA TN 2822 Revised 2. NACA 1148.

Transverse vibrations of hollow thinwalled cylindrical beams, by Bernard Budiansky and Edwin T. Kruszewski. U. S. National Advisory Committee for Aeronautics. 1953. 12p diagrs, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.20. PB 115070

Supersedes NACA TN 2682.
1. Beams, Structural - Vibration - Calculation 2. Cylinders - Loading 3. Shear - Lag - Analysis 4. Shear stress - Analysis 5. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 6. NACA 1129 7. NACA TN 2682 Revised.

Statikens energimetoder använda pa linjära randvärdesproblem (Energy methods of statics applied to linear boundary value problems), by Sven T. A. Ödman. Svenska Forskningsinstitutet för Cement och Betong, Stockholm. 1954. 18p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115035

Reprinted from Betong nr. 1, 1954.
1. Boundary layer - Theory - Sweden 2. Equations, Differential - Sweden 3. Static pressure - Theory - Sweden 4. Svenska Forskningsinstitutet för Cement och Betong. Meddelanden nr. 30.

Stress analysis of circular semimonocoque cylinders with cutouts by a perturbation load technique, by Harvey G. McComb, Jr. U. S. National Advisory Committee for Aeronautics. Sep 1954. 37p drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115220

The method involves the use of so-called perturbation solutions which are superposed on the stress distribution that would exist in the structure with no cutout in such a way as to give the effects of a cutout. The method can be used for any loading case for which the structure without the cutout can be analyzed and is sufficiently versatile to account for stringer and shear reinforcement about the cutout. NACA TN 3200.

Stress distributions caused by three types of loading on a circular semimonocoque cylinder with flexible rings, by Harvey G. McComb, Jr. U. S. National Advisory Committee for Aeronautics. Sep 1954. 54p diagrs Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115122

The results are given as formulas for the stringer loads and shear flows in the shell due to each type of loading. For each loading case these formulas can be used to construct tables of influence coefficients giving stringer loads and shear flows in the neighborhood of the load due to a unit magnitude of that load. NACA TN 3199.

TEXTILES AND TEXTILE PRODUCTS

Aircraft material specification: Nylon fabric. Gt. Brit. Ministry of Supply. May 1954. 3p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 115119

1. Nylon - Specifications - Gt. Brit. 2. Airplanes - Materials - Specifications - Gt. Brit. 3. MS DTD MS 847.

Case study data on productivity and factory performance: Cotton textile dyeing and finishing. U. S. Bureau of Labor Statistics. Jun 1954. 155p photos, diagrs, graph, tables Available from U. S. Bureau of Labor Statistics, Washington 25, D. C. PB 115052

Prepared for the Foreign Operations Administration, Industrial and Technical Division.
1. Textiles, Cotton - Dyes and dyeing 2. Textiles, Cotton - Finishing 3. BLS R 66.

Friction and lubrication of nylon, by R. C. Bowers, W. C. Clinton, and W. A. Zisman. U. S. Naval Research Laboratory. Jul 1954. 13p tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111510

The static and kinetic friction for steel against nylon and for nylon against nylon both dry and lubricated have been studied. Lubricants studied included water, ethylene glycol, glycerine, fatty acids, paraffins, silicones, an alcohol, an amine and a fluorinated acid, amine and hydrocarbon. NRL R 4389.

Review of textile research and development during 1953, edited by Richard Steele, Cornell Messler and R. K. Toner. Textile Research Institute, Princeton, N. J. May 1954. 57p Available from

Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115350

Technical report no. 5. Contract no. Nonr-09002, Project no. NR 330-014. For report no. 4 (1953) see PB 110702.
1. Textiles - Research - Bibliography 2. Textiles - Manufacture - Bibliography 3. Textiles - Dyes and dyeing - Bibliography 4. Textiles - Finishing - Bibliography 5. Textiles - Tests - Bibliography.

Studies on the interrelationship of staple fiber characteristics, fabric manufacturing processes and serviceability, by R. G. Stoll. U. S. Office of the Quartermaster General. Research and Development Division. Textiles, Clothing and Footwear Branch. May 1954. 85p photos, diagr, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $2.00. PB 111472

This paper describes a comprehensive statistically designed experiment covering the manufacture of 72 spun rayon fabrics, the evaluation of the processing characteristics, and a comprehensive analysis of the fabric properties and the interactions with fabric design and finish on the basis of laboratory data and evaluation of aesthetic appeal and service performance. QMC TSR 84.

Wettability of nylon, polyethylene terephthalate, and polystyrene by hydrogen-bonding and halogenated liquids, by A. H. Ellison and W. A. Zisman. U. S. Naval Research Laboratory. May 1954. 9p graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111448

A study has been made of the wettability by a variety of liquids of smooth surfaces of polyethylene terephthalate, nylon, and polystyrene. Comparison of the results for nylon with previous results for polyethylene and of those for polyethylene terephthalate with those for polystyrene showed that the wettability by polar hydrogen-bonding liquids is increased by the presence of both the amide group and the ester group in the solid surface, but to a much greater extent by the amide group. It was found that perfluorolauric acid could be adsorbed on nylon from n-decane solution rendering the nylon surface oleophobic. NRL R 4362.

TRANSPORTATION EQUIPMENT

Notes on the power-speed-weight relationship for vehicles, Chapter I, by Kenneth S. M. Davidson. Stevens Institute of Technology. Experimental Towing Tank, Hoboken, N. J. Mar 1951. 50p diagrs, graphs, map, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 114921

These notes describe certain steps taken in an effort to establish a single frame of reference within which to view the relative potentialities and limitations of vehicles of widely differing types. Technical memorandum no. 97.

Aeronautics

Aircraft

Airfoil section characteristics at high angles of attack, by Laurence K. Loftin, Jr. U. S. National Advisory Committee for Aeronautics. Aug 1954. 10p graphs Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115038

1. Angle of attack - Effect of lift coefficient 2. Airfoils, Symmetrical - Angle of attack 3. Airfoils, Symmetrical - Design 4. Airfoils, Symmetrical - Thickness - Effect on drag 5. Airfoils, Symmetrical - Lift coefficient 6. Helicopters - Design 7. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 8. NACA TN 3241.

Application of two-dimensional vortex theory to the prediction of flow fields behind wings of wing-body combinations at subsonic and supersonic speeds, by Arthur Wm. Rogers. U. S. National Advisory Committee for Aeronautics. Sep 1954. 93p photo, drawing, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115353

1. Wings - Wake - Vortex motion 2. Downwash - Calculation 3. Flow, Subsonic - Theory 4. Flow, Supersonic - Theory 5. Vortex motion - Theory 6. U. S. Ames Aeronautical Laboratory, Moffett Field, Calif. 7. NACA TN 3227.

Calculations on the forces and moments for an oscillating wing-aileron combination in two-dimensional potential flow at sonic speed, by Herbert C. Nelson and Julian H. Berman. U. S. National Advisory Committee for Aeronautics. 1953. 18p diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.25. PB 115069

1. NACA TN 2590 Revised 2. NACA 1128.

Charts and approximate formulas for the estimation of aeroelastic effects on the lateral control of swept and unswept wings, by Kenneth A. Foss and Franklin W. Diederich. U. S. National Advisory Committee for Aeronautics. 1953. 28p diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.30. PB 115075

1. NACA TN 2747 Revised 2. NACA 1139.

Charts and approximate formulas for the estimation of aeroelastic effects on the loading of swept and unswept wings, by Franklin W. Diederich and Kenneth A. Foss. U. S. National Advisory Committee for Aeronautics. 1953. 51p graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.50. PB 115076

1. NACA TN 2608 Revised 2. NACA 1140.

Computation of the critical speeds of aileron reversal, wing torsional divergence and wing-aileron divergence, by Louis H. Shornick. U. S. Army Air Forces. Engineering Div. Aircraft Laboratory, Wright Field, Dayton, Ohio. Dec 1942. 59p graphs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115188

Some pages may not reproduce well. M. R. report no. ENG-M-51/VF 18, Add. 1. Includes Appendices 1-5.
1. Airplanes - Control surfaces - Stresses 2. Air speed - Calculation 3. Ailerons - Reversal 4. Ailerons - Rolling moments 5. Torsion - Theory 6. AAF ENG-M-51/VF 18, Add. 1.

Deflection and stress analysis of thin solid wings of arbitrary plan form with particular reference to delta wings, by Manuel Stein, J. Edward Anderson and John M. Hedgepeth. U. S. National Advisory Committee for Aeronautics. 1953. 22p photo, diagr, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.25. PB 115071

1. NACA TN 2621 Revised 2. NACA 1131.

Electric whirl test of Landgraf Helicopter Company H-2 rotor, by D. D. Ziegler. U. S. Air Material Command. Engineering Division. Propeller Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jul 1949. 26p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115411

1. H-2 (Helicopter) 2. Helicopters - Rotors - Tests 3. AAF TR 5908.

Estimation of the maximum angle of sideslip for determination of vertical-tail loads in rolling maneuvers, by Ralph W. Stone, Jr. U. S. National Advisory Committee for Aeronautics. 1953. 14p diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.15. PB 115082

1. NACA TN 2633 Revised 2. NACA 1136.

Experimental investigation of wheel spin-up drag loads, by Benjamin Milwitzky, Dean C. Lindquist and Dexter M. Potter. U. S. National Advisory Committee for Aeronautics. Sep 1954. 18p photo, drawing, graphs Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115222

Supersedes NACA RM L53E06b.
1. Landing gear - Impact loads 2. Landing gear - Wheels - Spin 3. Loads, Landing - Impact 4. Loads, Structural - Dynamic tests 5. Friction - Tests 6. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 7. NACA TN 3246.

Investigation of lift, drag, and pitching moment of a 60° delta-wing-body combination (Agard calibration model B) in the Langley 9-inch supersonic tunnel, by August F. Bromm, Jr. U. S. National Advisory Committee for Aeronautics. Sep 1954. 18p photos, drawing, graphs Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115225

1. Wings, Triangular - Drag 2. Wings, Triangular - Lift 3. Wings, Triangular - Pitching moment 4. Wings, Triangular - Wind tunnel tests 5. Wind tunnels, Supersonic - Tests 6. AGARD calibration model B (Triangular wind model) 7. Reynolds number - Effect 8. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 9. NACA TN 3300.

Metal wing construction. Part II: Mathematical investigations, by John E. Younger. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Jul 1930. 63p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 115189

Some pages will not reproduce. A.D.M. 1020, Part II.
1. Wings - Stress analysis 2. Torsion - Theory 3. Wings - Design 4. Beams, Box - Torsion - Theory 5. Plates, Curved - Stresses 6. AAF TR 3288.

Note on an application of the tilting plate method of Mach number variation for wind tunnel tests at low supersonic speeds, by J. Seddon and L. Haverty. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1953. 18p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 115135

Cover date is 1954. S.O. code no. 23-9007-68.
1. Wind tunnels, Supersonic - Velocity distribution - Gt. Brit. 2. Wind tunnels, Supersonic - Equipment - Gt. Brit. 3. Wind tunnels, Supersonic - Mach number control - Gt. Brit. 4. Mach number - Variation - Methods - Gt. Brit. 5. ARC CP 168 6. RAE TN Aero 2238.

Notes on the dynamic response of an aircraft to gusts and on the variation of gust velocity along the flight path with special reference to measurements in Lancaster P. D. 119, by Anne Burns. Gt. Brit. Ministry of Supply. Aeronautical Research

Council. Sep 1949. 24p diagrs, graphs (3 fold) Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.70. PB 115003

Cover date is 1954. S. O. code no. 23-2759.
1. Airplanes - Flight path - Gt. Brit. 2. Gust loads - Gt. Brit. 3. Recorders, Flight load - Gt. Brit. 4. Instruments, Aeronautical - Gust load data - Gt. Brit. 5. ARC RM 2759.

Review of the Air Force materials research and development program, by Louise M. Koeker. U. S. Air Force. Air Research and Development Command. Wright Air Development Center. Materials Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jul 1954. 143p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $3.75. PB 111537

A review of the research and development work sponsored in the field of materials and processes over the past decade is presented. Abstracts of WADC Technical Reports for the period 1 July 1951 to 30 June 1953 are included. A summary of Technical Reports published in the areas of metallurgy, textiles, petroleum products, structural materials, rubbers, plastics, packaging, protective treatments, analysis and measurements are included also. Abstracts of Technical reports from 1 Jul 1951 to 30 Jun 1953. AAF WADC TR 53-373.

Section characteristics of an NACA 0006 airfoil with area suction near the leading edge, by James A. Weiberg and Robert E. Dannenberg. U. S. National Advisory Committee for Aeronautics. Sep 1954. 47p photos, drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115354

1. Airfoils - Aerodynamics 2. Airfoils - Lift coefficient 3. Airfoils - Pressure distribution 4. U. S. Ames Aeronautical Laboratory, Moffett Field, Calif. 5. NACA TN 3285.

Similarity law for hypersonic flow and requirements for dynamic similarity of related bodies in free flight, by Frank M. Hamaker, Stanford E. Neice and Thomas J. Wong. U. S. National Advisory Committee for Aeronautics. 1953. 13p diagrs, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.20. PB 115078

Supersedes NACA TN 2443 (PB 104970) and NACA TN 2631 (PB 106254).
1. NACA TN 2443 Revised 2. NACA TN 2631 Revised 3. NACA 1147.

Simple method of computing C_D from wake traverses at high-subsonic speeds, by J. S. Thompson. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Dec 1944. 12p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 115214

Cover date is 1954. S. O. code no. 23-2914.
1. Airfoils - Drag - Theory - Gt. Brit. 2. Airfoils - Wake - Drag calculation - Gt. Brit. 3. Flow, Subsonic - Theory - Gt. Brit. 4. Pitot-static tubes - Calibration - Gt. Brit. 5. ARC RM 2914.

Some aspects of the helicopter noise problem, by Harvey H. Hubbard and Leslie W. Lassiter. U. S. National Advisory Committee for Aeronautics. Aug 1954. 14p photo, diagr, graphs Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115037

1. Helicopters - Noise - Elimination 2. Helicopters - Rotors - Noise - Elimination 3. Noise, Exhaust - Elimination 4. NACA TN 3239.

Starting and operating limits of two supersonic wind tunnels utilizing auxiliary air injection downstream of the test section, by Henry R. Hunczak and Morris D. Rousso. U. S. National Advisory Committee for Aeronautics. Sep 1954. 28p photo, drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115223

1. Wind tunnels, Supersonic - Air conditions
2. Wind tunnels, Supersonic - Pressure 3. Flow, Jet mixing - Pressure 4. Mach number - Effect
5. Diffusers, Supersonic - Pressure distribution
6. Ducts, Air - Inlet pressure 7. NACA TN 3262.

Study of inadvertent speed increases in transport operation, by Henry A. Pearson. U. S. National Advisory Committee for Aeronautics. 1953. 13p graphs, table Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.20. PB 115074

1. NACA TN 2638 Revised 2. NACA 1138.

Symmetric flutter characteristics of a hypothetical delta wing, by D. L. Woodcock. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1950. 23p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.60. PB 114949

Cover date is 1954. S. O. code no. 23-2839.
1. Wings, Triangular - Flutter - Calculation - Gt. Brit. 2. ARC RM 2839.

Theoretical analysis of an airplane acceleration restrictor controlled by normal acceleration, pitching acceleration, and pitching velocity, by Christopher C. Kraft, Jr. U. S. National Advisory Committee for Aeronautics. Sep 1954. 42p graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115221

1. Airplanes - Maneuverability 2. Airplanes - Acceleration - Restrictive devices 3. Controls, Longitudinal - Operation - Theory 4. Controls, Automa-

tic - Operation - Theory 5. Pitching moments 6. NACA TN 3243.

Thinwalled monocoques, by N. J. Hoff. Polytechnic Institute of Brooklyn. Dept. of Aeronautical Engineering and Applied Mechanics. Sep 1947. 38p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 114922

Investigations are described. Individual problems treated in some detail are general instability, numerical methods of stress analysis, and stress concentrations caused by concentrated transverse loads in reinforced monocoque cylinders. For presentation at the joint conference of the Royal Aeronautical Society and the Institute of Aeronautical Sciences in London, Sep 3-6, 1947.

Trajectory precision requirements for automatic landing, by Joseph L. Ryerson. U. S. Air Force. Air Research and Development Command. Rome Air Development Center, Griffiss Air Force Base, Rome, N. Y. Aug 1954. 33p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115258

1. Airplanes - Landing, Automatic 2. Trajectory determination 3. Airplanes - Altitude - Determination 4. AAF RADC TR 54-41.

Transonic flow past swept and unswept wings between parallel walls, by Willi Jacobs. Flygtekniska Forsöksanstalten (FFA), Stockholm. Feb 1954. 33p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115253

1. Wings, Unswept - Drag - Calculation - Sweden 2. Wings, Swept - Drag - Calculation - Sweden 3. Mach number - Effect - Sweden 4. Flow, Transonic - Theory - Sweden 5. Wind tunnels - Walls - Effects - Sweden 6. FFA 55.

Instruments

Evaluation of Vu-Graph techniques for GCI plotting applications, by Alvin L. Downing. U. S. Air Force. Air Research and Development Command. Rome Air Development Center, Griffiss Air Force Base, Rome, N. Y. Jul 1954. 21p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 115256

1. VuGraph (Trade name) 2. Radar, Ground controlled approach - Equipment 3. AAF RADC TR 54-37.

Initial results of instrument-flying trials conducted in a single-rotor helicopter, by Almer D. Crim, John P. Reeder and James B. Whitten. U. S. National Advisory Committee for Aeromahtucs. 1953. 9p photos, diagrs, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.20. PB 115073

1. NACA TN 2721 Revised 2. NACA 1137.

Measurement of position error at high speeds and altitude by means of a trailing static head, by K.W. Smith. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1952. 34p photo, drawings, diagr, graphs, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 114951

Cover date is 1954. S. O. code no. 23-9007-60. 1. Static pressure - Measurements - Errors - Gt. Brit. 2. Position finding - Gt. Brit. 3. Position finders - Errors - Gt. Brit. 4. Glauert law (Subsonic flow) 5. Instruments, Measurement - Gt. Brit. 6. Flow, Subsonic - Theory - Gt. Brit. 7. Mach number - Effect - Gt. Brit. 8. Gt. Brit. Royal Aircraft Establishment, Farnborough, England 9. ARC CP 160 10. RAE TN Aero 2163.

Turbulent-heat-transfer measurements at a Mach number of 3.03, by Maurice J. Brevoort and Bernard Rashis. U. S. National Advisory Committee for Aeronautics. Sep 1954. 21p diagrs, graphs, table Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115123

1. Heat - Transference - Measurements 2. Heat - Transference - Theory 3. Recorders, Temperature - Design 4. Mach number - Effect 5. Reynolds number - Effect 6. NACA TN 3303.

Engines and Propellers

Dynamics of mechanical feedback-type hydraulic servomotors under inertia loads, by Harold Gold, Edward W. Otto and Victor L. Ransom. U. S. National Advisory Committee for Aeronautics. 1953. 23p photos, diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.25. PB 115067

1. NACA TN 2767 Revised 2. NACA 1125.

Flame stabilization in a hot gas stream by the upstream air blast injection of kerosene fuel, by N. Golitzine. Canada. National Aeronautical Establishment. May 1954. 17p photo, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. Available for exchange from National Aeronautical Establishment, Montreal Road, Ottawa, Canada. PB 115228

1. Flame - Stability - Canada 2. Jet engines - Fuel systems - Research - Canada 3. Kerosene - Effect on exhaust gases - Canada 4. Exhaust gases - Pressure - Canada 5. Exhaust gases - Temperature - Canada 6. Exhaust gases - Velocity - Canada 7. NAEC LR-102.

Hovering performance of a helicopter rotor using NACA 8-H-12 airfoil sections, by Robert D. Powell, Jr. U. S. National Advisory Committee for Aeronautics. Aug 1954. 14p photos, graphs Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115110

1. Helicopters - Rotors - Test 2. Helicopters - Hovering 3. Helicopter blades - Tests 4. Airfoils - Drag 5. Drag, Profile - Measurements 6. Torque, Propeller - Measurements 7. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 8. NACA TN 3237.

Training and Training Devices

Attitudes relevant to bomber crew performance in combat, by Roy A. DeGaugh and Dorothy M. Knoell. U. S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Crew Research Laboratory, Randolph Air Force Base, Texas. May 1954. 37p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115211

Project no. 7713, Task no. 77220.
1. Crew, Air - Performance 2. Group behavior 3. Psychology, Applied 4. AAF PTRC TR 54-18.

Effects of basic training on learning by airmen of different intellectual ability, by Donald Thistlethwaite, Howard Moltz, Joseph Kamenetzky and Henry de Haan. U. S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Personnel Research Laboratory, Lackland Air Force Base, San Antonio, Texas. May 1954. 13p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115201

Contract no. AF 33(038)-25726, Univ. of Illinois.
Project no. 503-001-0009.
1. Personnel, Flying - Training 2. Ability tests - Evaluation 3. Learning - Psychological factors 4. AAF PTRC TR-54-14.

Aerodynamics

Aerodynamic characteristics of a refined deepstep planing-tail flying-boat hull with various forebody and afterbody shapes, by John M. Riebe and Rodger L. Naeseth. U. S. National Advisory Committee for Aeronautics. 1953. 21p photos, diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.25. PB 115077

1. NACA 1144 2. NACA TN 2489 Revised.

Aerodynamic characteristics of the NACA 64-010 and 0010-1.10 40/1.051 airfoil sections at Mach numbers from 0.30 to 0.85 and Reynolds numbers from 4.0×10^6 to 8.0×10^6, by Laurence K. Loftin, Jr. U. S. National Advisory Committee for Aeronautics. Aug 1954. 17p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115111

1. Airfoils - Wind tunnel tests 2. Airfoils - Aerodynamics 3. Airfoils - Drag 4. Airfoils - Lift coefficient 5. Mach number - Effect 5. Reynolds number - Effect 7. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 8. NACA TN 3244.

Calibration of the R.A.E. no. 18 (9 in. x 9 in.) supersonic wind tunnel. Part I: Preliminary investigations, by W. T. Lord and D. Beastall. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1953. 45p drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, New York. $1.00. PB 115134

Cover date is 1954. S. O. code no. 23-9007-62.
1. Wind tunnels, Supersonic - Calibration - Gt. Brit. 2. Wind tunnels, Supersonic - Design - Gt. Brit. 3. Wind tunnels, Supersonic - Equipment - Gt. Brit. 4. Mach number - Effect - Gt. Brit. 5. Reynolds number - Effect - Gt. Brit. 6. ARC CP 162 7. RAE TN Aero 2235.

Direct measurements of skin friction, by Satish Dhawan. U. S. National Advisory Committee for Aeronautics. 1953. 22p photos, drawings, diagrs, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.25. PB 115080

1. California Institute of Technology. Guggenheim Aeronautics Laboratory, Pasadena, Calif. 2. NACA 1121 3. NACA TN 2567 Revised.

Effect of blade-section thickness ratios on the aerodynamic characteristics of related full-scale propellers at Mach numbers up to 0.65, by Julian D. Maynard and Seymour Steinberg. U. S. National Advisory Committee for Aeronautics. 1953. 57p photos, drawings, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.55. PB 115068

Supersedes NACA RM L9D29.
1. Propellers - Aerodynamics - Effect of blade thickness 2. Propeller blades - Thickness 3. Mach number - Effect 4. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 5. NACA 1126.

Exact solutions of laminar-boundary-layer equations with constant property values for porous wall with variable temperature, by Patrick L. Donoughe and John N. B. Livingood. U. S. National Advisory Committee for Aeronautics. Sep 1954. 42p graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115219

1. Boundary layer, Laminar - Flow - Pressure gradients 2. Flow, Laminar - Heat transfer 3. Heat - Transference - Aerodynamics 4. Heat - Transference - Theory 5. Turbines, Aerodynamic - Cooling 6. Prandtl number - Effect 7. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 8. NACA TN 3151.

Heat transfer from a hemisphere-cylinder equipped with flow-separation spikes, by Jackson R. Stalder and Helmer V. Nielsen. U. S. National Advisory Committee for Aeronautics. Sep 1954. 29p photos, graphs Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115224

1. Mach number - Effect 2. Reynolds number - Effect 3. Cylinders, Circular - Heat transference 4. Cylinders, Circular - Pressure distribution 5. Spikes, Flow-separation - Effect on heat transfer 6. Flow, Supersonic - Heat transference 7. Flow, Turbulent - Heat transference 8. U. S. Ames Aeronautical Laboratory, Moffett Field, Calif. 9. NACA TN 3287.

Investigation of Mach number changes obtained by discharging high-pressure pulse through wind tunnel operating supersonically, by Rudolph C. Haefeli and Harry Bernstein. U. S. National Advisory Committee for Aeronautics. Aug 1954. 14p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115040

1. Wind tunnels, Supersonic - Aerodynamics 2. Wind tunnels, Supersonic - Nozzles 3. Mach number - Effect 4. Shock waves - Photography 5. Gust loads 6. Schlieren photographs 7. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 8. NACA TN 3258.

Laminar boundary layer on cone in supersonic flow at large angle of attack, by Franklin K. Moore. Appendix B: Numerical solution of differential equations, by Lynn Albers. U. S. National Advisory Committee for Aeronautics. 1953. 15p diagrs, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.20. PB 115072

1. Flow, Supersonic - Theory 2. Cones - Boundary layer 3. Boundary layer - Theory 4. Cones - Aerodynamics 5. Angle of attack - Effect on pressure 6. NACA 1132 7. NACA TN 2844 Revised.

Review of planing theory and experiment with a theoretical study of pure-planing lift of rectangular flat plates, by Charles L. Shuford, Jr. U. S. National Advisory Committee for Aeronautics. Aug 1954. 34p graph Available from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 115109

1. Planing surfaces - Hydrodynamics - Theory 2. Plates, Rectangular - Hydrodynamics 3. Plates, Flat - Hydrodynamics 4. Linear systems - Computing methods 5. Seaplanes - Hulls - Impact pressures 6. Seaplanes - Hulls - Length-beam ratio 7. Seaplanes - Hulls - Planing 8. Hydrodynamics - Theory 9. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 10. NACA TN 3233.

Tabulation of the Blasius function with blowing and suction, by H. W. Emmons and D. C. Leigh. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1953. 81p graphs (1 fold), tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.60. PB 115133

Cover date is 1954. S. O. code no. 23-9007-57.
1. Blasius formula (Aerodynamics) - Gt. Brit. 2. Boundary layer - Suction effect - Gt. Brit. 3. Boundary layer - Velocity distribution - Theory - Gt. Brit. 4. Fluids, Compressible - Flow - Gt. Brit. 5. Flow, Fluid - Mathematical analysis - Gt. Brit. 6. ARC CP 157.

Marine Transportation

Bibliography of the submarine, 1557 to 1953. National Research Council. Committee on Undersea Warfare. Mar 1954. 274p Available from Publications Office, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. $1.50. PB 114992

1. Submarines - Bibliography 2. NRC 307.

Dynamic stability on course of towed ships, by Adolf G. Strandhagen, Earl E. Schoenherr and Francis M. Kobayashi. University of Notre Dame. Dept. of Engineering Mechanics, Notre Dame, Ind. May 1950. 35p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115286

Paper presented at Spring meeting of the Society of Naval Architects and Marine Engineers in Cleveland, Ohio, May 25, 1950.
1. Ships - Towing resistance 2. Ships, Towed - Stability, Dynamic.

Further studies of the response of a cylindrical shell to a transverse shock wave, by M. L. Baron and H. H. Bleich. Columbia University. Dept. of Civil Engineering. Dec 1953. 48p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 114945

Contract Nonr-266(08), Technical report no. 10. CU-10-53-ONR-266(08)-C. E.
1. Shells (Submarine), Cylindrical - Vibration 2. Shock waves - Kinetic reactions.

Review of porpoising instability of seaplanes, by A. G. Smith and H. G. White. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb

1944. 41p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.50. PB 114885

Cover date is 1954. S. C. code no. 23-2852.
1. Seaplanes - Porpoising - Instability - Gt. Brit.
2. ARC RM 2852.

Ricerche sul fiaccamento degli scafi (Researches on the failure of ship hulls), by Leonardo Fea. Translated by Frank Rizzo. 1953. 71p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photocopy $10.25. PB 114843

Translated from Rivista Marittima, Technical supplement 1953.
1. Hulls - Fractures - Italy 2. Hulls - Stresses - Italy 3. NAVSHIPS T 553.

Subsurface warfare: History of division 6, NDRC, by John Herrick. U. S. Research and Development Board. Jan 1951. 130p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $2.00. PB 103566

Prepared under the direction of John T. Tate, Chief, Division 6, NDRC (1942-1946). Issued for the Office of Scientific Research and Development.
1. Submarine warfare - History 2. Submarines - History.

Theoretical research on the dynamics of a ship's structure, by Jesse Ormondroyd, George K. Hess, Jr., and Robert L. Hess. Michigan. University. Dept. of Engineering Research, Ann Arbor, Mich. Jun 1947. 68p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 114527

Contract N5ori-116. Project M670-4.
1. Equations of motion 2. Beams - Bending - Theory 3. Beams - Stress analysis 4. Beams - Plastic deformation 5. Ships - Wave resistance - Theory 6. Loads, Dynamic - Theory 7. Vibration - Theory.

Wave profile of a Vee-planing surface, including test data on a 30° deadrise surface, by B. V. Korvin-Kroukovsky, Daniel Savitsky, William F. Lehman. Stevens Institute of Technology. Experimental Towing Tank, Hoboken, N. J. Apr 1949. 52p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 115276

This is the summary report on a series of tests which were made to determine the shape of the wave contours in the wake of prismatic planing surfaces of 10°, 20°, and 30° deadrise. Also presented is a comparison of the data obtained from tests of all three deadrise surfaces. Report no. 339. Contract N6 onr-247, Task order IV, Project no. NR 062-012. E.T.T. project no. CC839.

WATER SUPPLY, SANITATION AND PUBLIC HEALTH

Carbon and nitrogen in near shore marine sediments, by Richard G. Bader. Washington. University. Dept. of Oceanography, Seattle, Wash. Jul 1954. 18p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 114974

Technical report no. 36. Contract N8onr-520/III, Project NR 083 012.
1. Sediment, Marine - Carbon content 2. Sediment, Marine - Nitrogen content 3. WU OR 54-24.

Climatic criteria defining efficiency limits for certain industrial activities. Section 4a: Water supply. Illinois. University. Dept. of Geography. n.d. 165p diagr, maps, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $3.00. PB 111454

Contract no. AF 19(604)-416. For other parts see PB 113881-113907.
1. Industries - Water requirements 2. Water - Industrial use 3. Water supply 4. Industries - Location - Effect of climate.

Desalting of sea water by freezing processes, by Kurt H. Nelson and Thomas G. Thompson. Washington. University. Dept. of Oceanography, Seattle, Wash. Nov 1953. 26p photo, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114634

Contract N8onr-520/III, Project NR 083-012. Reference 53-1. Technical report no. 13.
1. Sea water - Desalination 2. Sea water - Freezing 3. Sea water - Chlorinity.

Eastern north Pacific, offshore physical and chemical data, July-September 1953, by Robert G. Paquette, Eugene E. Collias and Cuthbert M. Love. Washington. University. Dept. of Oceanography, Seattle, Wash. Jun 1954. 28p maps, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114972

Technical report no. 34. Contract N8onr-520/III, Project NR 083 012 and Contract Nonr-477(01), Project NR 083 072.
1. Sea water - Chemical analysis 2. Sea water - Physical analysis 3. Sea water - Sampling 4. Sea water - Oxygen content 5. Sea water - Temperature 6. WU OR 54-20.

Heating of water by submerged combustion, by Kenneth A. Kobe and Robert N. Hall, Jr. Texas. University. Bureau of Engineering Research, Austin, Texas. Jun 1954. 17p photos, drawing, tables Available from Bureau of Engineering Research, University of Texas, Austin, Texas. PB 114610

This project covers the design, construction and operation of a submerged combustion unit to supply relatively large quantities of hot water. The object of the research is to determine if such a unit is practical for commercial applications, as laundries, boiler feed preheaters, and other similar installations. Circular no. 24.

Literature survey of boundary-layer development on smooth and rough surfaces at zero pressure gradient, by William Douglas Baines. Iowa State University. Institute of Hydraulic Research, Iowa City, Iowa. 1951. 54p graphs (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 114893

Contract N8onr-500.
1. Plates, Flat - Boundary layer 2. Boundary layer Laminar - Flow 3. Boundary layer, Turbulent - Flow 4. Flow, Laminar - Theory 5. Flow, Turbulent - Theory 6. Flow, Viscous - Theory.

Local variability in marine sediments, by Richard G. Bader. Washington. University. Dept. of Oceanography, Seattle, Wash. Dec 1953. 21p diagrs, graphs, map, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114930

Contract N8onr-520/III, Project NR 083-012.
1. Ocean bottom - Sampling 2. Sediment - Analysis - Pugent sound 3. Sampling devices 4. WU OR 53-6.

Patuxent River spring cruise, 3 Apr-8 Apr 1952, by D. W. Pritchard. Johns Hopkins University. Chesapeake Bay Institute. Nov 1953. 59p map, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $7.75. PB 114631

Reference 53-14. Data report 16.
1. Sea water - Chemical analysis 2. Sea water - Salinity 3. Sea water - Temperature.

Physical and chemical data for Puget Sound and approaches, October-December 1952, by Clifford A. Barnes and Eugene E. Collias. Washington. University. Dept. of Oceanography, Seattle, Wash. Jun 1954. 66p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.25, Photocopy $9.00. PB 114973

Technical report no. 35. Contract N8onr-520/III, Project NR 083 012.
1. Sea water - Chemical analysis 2. Sea water - Physical analysis 3. Sea water - Sampling 4. Sea water - Oxygen content 5. Sea water - Temperature 6. WU OR 54-23.

Proceedings of the third annual water symposium on water pollution, Dec 14-15, 1953. Louisiana. Engineering Experiment Station, Baton Rouge, La. 1954. 49p diagr, maps, table Available from College of Engineering, Louisiana State University and Agricultural and Mechanical College, Baton Rouge 3, La. $.50. PB 114710

Contents: Biological indices of pollution as observed in Louisiana streams, by K. E. Biglane and R. A. Lafleur. - Pollution problem in the Ouachita River, by J. B. Anderson and H. P. Nicholson. - Importance of surface water supply in industrial development, by Elmer D. Conner. - Atchafalaya versus Mississippi, by John R. Hardin. - Bio-assay techniques, by Louis Freeman. - Sugar refinery waste problems, by Walter Godchaux, Jr. - Water pollution, by Thomas M. Lowe. L EES B 43.

Report of the Hydraulics Research Board with the Report of the Director of Hydraulics Research for the year 1953. Gt. Brit. Dept. of Scientific and Industrial Research. Hydraulics Research Board. 1954. 73p photos, diagrs, graphs, col maps (4 fold), tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N.Y. $1.70. PB 114659

S. C. code no. 47-172-0-53.
1. Hydraulics - Research - Gt. Brit.

Proceedings of the seventeenth annual short course for water and sewerage plant superintendents and operators, 1954, sponsored by the General Extension Division and the College of Engineering of Louisiana State University in cooperation with the Louisiana State Department of Health and the Louisiana Conference on Water Supply and Sewerage. Louisiana. Engineering Experiment Station, Baton Rouge, La. 1954. 165p diagrs, graph, tables Available from College of Engineering, Louisiana State University and Agricultural and Mechanical College, Baton Rouge 3, La. $1.00. PB 114990

1. Water supply - Sanitation 2. Sewage disposal 3. Louisiana State University. College of Engineering 4. Louisiana. Dept. of Health 5. Louisiana Conference on Water Supply and Sewerage 6. L EES B 44.

Report of the Water Pollution Research Board with the Report of the Director of Water Pollution Research for the year 1953. Gt. Brit. Dept. of Scientific and Industrial Research. Water Pollution Research Board. Jan 1954. 59p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 114399

S. O. code no. 47-72-0-53.

1. Water - Pollution - Gt. Brit. 2. Sewage - Purification - Gt. Brit. 3. Trade waste - Purification - Gt. Brit.

Scale effects in cavitating flow, a preliminary report, by Blaine R. Parkin. California Institute of Technology. Hydrodynamics Laboratory, Pasadena, Calif. Dec 1951. 34p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 114907

The roles of nuclei and air diffusion in ordinary water and the kinetic theory of liquids for pure water are considered as to their bearing on cavitation scale effects. The experimental results show that both the maximum bubble size and the cavitation number for incipient cavitation are functions of the model scale, even for cases where Reynolds number effects are not important. Report no. 21-7. Contract N6onr-24420 (NR 062-059).

Vertical water entry of a wedge, by W. J. Karzas. U. S. Naval Ordnance Test Station, Inyokern, Calif. Oct 1951. 35p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 114577

An exact solution for the flow pattern may be found by means of an iterative procedure in which a free surface shape is assumed, velocities calculated, and a new surface shape found. The process is convergent, but probably slowly. Certain criteria for the choice of the initial surface ware presented and discussed. An unsuccessful attempt to solve the entry problem by variational methods is outlined, and the reason for its failure is discussed. NOTS TM 576.

Water clarity nomographs, by Frances R. Culver. California. University. Scripps Institution of Oceanography. Visibility Laboratory, San Diego, Calif. Jul 1953. 14p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 114641

A description is given of two nomographs which expedite calculations of the expression specifying the contrast reduction of a submerged object due to attenuation processes in the water along the observer's path of sight. Illustrations of the nomographs, accompanied by explanations of the construction, the scale equations, and details of procedure for use are discussed. Illustrative examples are included. Contracts N5ori-07831 and NObsr-43356. UC SIO Ref 53-46.

MISCELLANEOUS

Annotated bibliography of adult literacy training materials, by Louis A. D'Amico, Nicholas A. Fattu, Lloyd S. Standlee. Indiana. University. Institute of Educational Research, Bloomington, Ind. 1954. 94p Available from Institute of Educational Research, School of Education, Bloomington, Ind. $1.00. PB 115178

Contract Nonr-908(01).
1. Education, Adult - Bibliography.

Annotated, selected bibliography on marine boring organisms, by Robert J. Menzies. 1953? 12p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 115004

1. Marine borers - Bibliography.

Attitudes of scientists and engineers about their government employment, by Clarke D. Ahlberg and John C. Honey. Syracuse University. Maxwell Graduate School of Citizenship and Public Affairs, Syracuse, N. Y. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Vol. 1. Jul 1950. 227p Microfilm $8.25, Photocopy $29.00. PB 115143

1. U. S. officials and employees 2. Employment - U. S. government 3. Engineers - U. S. government 4. Scientists - U. S. government.

Vol. II. Jul 1950. 425f Microfilm $9.25, Enlargement Print $56.50. PB 115144

1. U. S. Officials and employees 2. Employment - U. S. government 3. Engineers - U. S. government 4. Scientists - U. S. government.

Basic principles of scientific report writing and how to use them, by J. Raleigh Nelson. U. S. Office of Naval Research. Scientific Personnel Division. 1947. 13p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 114704

1. Reports, Technical - Preparation.

Crustal structure of the Artic regions from the Lg phase, by Jack Oliver, Maurice Ewing and Frank Press. Columbia University. Lamont Geological Observatory, Palisades, N. Y. Jul 1954. 31p maps, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 114989

Contract AF 19(122)-441.
1. Earth - Structure - Arctic regions 2. Seismology - Research 3. Love waves 4. CUN LGO TRS 38.

Face size project. Forsyth Dental Infirmary for Children, Boston, Mass. Under Contract DA-18-108-CML-2829. Order separate parts described below from Library of Congress, Publication

Board Project, Washington 25, D. C., giving PB number of each part ordered.

Bi-monthly report no. I, covering the period 21 Jul to Sep 14, 1951, by Stanley M. Garn. Sep 1951. 11p drawings, tables Microfilm $2.00, Photocopy $2.75. PB 115098

The report includes information on fitting tests, including a preliminary report on the #6 mask.

Bi-monthly report no. II, covering the period 12 Sep to 15 Nov 1951, by Stanley M. Garn. Nov 1951. 56p photos, drawing, tables Microfilm $3.00, Photocopy $7.75. PB 115099

Information on fitting and comfort tests on the following masks: E-51A, E-52, E-52R1, E-52R3 and E-52R9. A discussion of the problem of the relationships among mask size, filter area, and physiological requirements of wearers, and on harness assembly is included.

Supplementary report no. 1: Tests on the infant protector, covering the period 15 Dec 1951 to 15 Jan 1952, by Stanley M. Garn. Jan 1952. 14p photos, tables Microfilm $2.00, Photocopy $2.75. PB 115347

1. E-51A (Gas mask) 2. Children - Protection from gas 3. Respirators, Children's - Tests.

Supplementary report no. II, 15 Jan 1952 to Feb 1952: A bibliography on military and industrial applications of anthropometry and applied physical anthropology, by Helen J. Colby and Stanley M. Garn. Feb 1952. 18p Microfilm $2.00, Photocopy $2.75. PB 115102

The purpose of this report is to bring together in classified form, titles of published reports on applied anthropometry, including industrial reports of limited circulation, relatively inaccessible research reports, reports published in the anthropological literature, and reports circularized by various government agencies. It is the further purpose of this report to provide ready reference to material on the theory of applied anthropometry, material on the application of human body size data, and to material on human body size per se.

Bimonthly report III, Part I: Design of sculptured headforms from measurements in three dimensions, covering the period from 11 Nov 1951 to 15 Jan 1952, by Edward E. Hunt, Jr. Feb 1952. 31p drawings, graph, tables Microfilm $2.50, Photocopy $5.25. PB 115342

The present report includes: a statement on the problems of designing sculptured head forms for the civilian population of the United States, the problem of sampling Americans to obtain accurate head and face measurements, the choice of measurements appropriate to the design of the headforms, and the present state of the facometer.

Bi-monthly report III, part II: Report on donning tests and harness research, covering the period from 15 Nov 1951 to 15 Jan 1952, by Stanley M. Garn. Jan 1952. 22p photos, drawings, tables Microfilm $2.25, Photocopy $4.00. PB 115100

Donning is a comparatively simple procedure and with some slight verbal assistance majority can be expected to don the mask. Extensive drills not necessary. Adjustment has to be explained to the subject.

Bimonthly report IV, Part I: Accuracy of the three dimensional faceometer as a measuring instrument, by George Maranjian and Edward E. Hunt, Jr, covering the period 15 Jan 1952 to 15 Mar 1952. Apr 1952. 56p drawings, tables Microfilm $3.00, Photocopy $7.75. PB 115343

The present report summarizes the results of detailed comparisons of Faceometer measurements and standard caliper measurements.

Bimonthly report IV, part II, 15 Jan 1952 to 15 Mar 1952, by Stanley Marion Garn. Mar 1952. 38p photos, drawings, graphs, tables Microfilm $2.50, Photocopy $5.25. PB 115101

It includes the results of fitting tests of two sizes of the E52R9 (dipped) mask, attempts to improve fitting range of each continued tests of the fixed (preadjusted) harnesses, and a schedule of tariffs for the E51 mask. Contents: A. Preliminary tests on the E52R9 dipped mask. - B. Stretch data on the 3 harness straps when worn (using the pre-adjusted harness). - C. Size tariffs in percentages for the E51R15 facepiece.

Bimonthly report V, Part I, 15 Mar 1952 to 15 May 1952, by Stanley M. Garn. May 1952. 34p photos, drawings Microfilm $2.50, Photocopy $5.25. PB 115344

The Forsyth Faceometer is an integrated positioning and measuring instrument design for the rapid mensuration of the head and face in three dimensions. As built by Dr. K. O. Lange of Lexington, Kentucky, the instrument logically breaks down into four basic components, (1) the frame (including the seat), (2) the head positioning and holding assembly, (3) the chin rest assembly, and (4) the measuring unit proper. These four components are described, but without dimensional information.

Bimonthly report V, Part II, 15 Mar 1952 to 15 May 1952, by Stanley M. Garn. May 1952. 63p photos, drawings (1 fold), graphs, tables Microfilm $3.25, Photocopy $9.00. PB 115345

This report includes a record of tests on the E51 IP series of masks (with darts), pattern changes in the E51-R15 mask, fitting tests on a mask made from a modified pattern, fitting range tests on a E52-R9 dipped mask of .013" latex, fitting and preference tests on a variety

of dipped latex masks ranging from .0135" to .025" in thickness, and tests on masks made from different mold sizes (designated #1, #2, and #3). A description of a new method of producing experimental molds from profile photographs and anthropometric measurements is included. Data on childrens' body size pertinent to infant-protector design is also summarized.

Bimonthly report VI, 15 May 1952 to 15 Jul 1952, by Stanley M. Garn. Jul 1952. 10p diagrs Microfilm $1.50, Photocopy $1.50. PB 115346

This report includes a summary of findings on, and suggested design changes for, the production-type E51R15 gas mask.

Final report on Part I: Fitting and donning tests on gas masks and related devices, by Stanley M. Garn, Helen J. Colby, Mary R. Crawford, Deborah E. Younger. Jul 1952. 28p map, graphs Microfilm $2.25, Photocopy $4.00. PB 115103

It includes a resume of fitting tests on E51 and E52 masks, and summarizes suggested design changes and recommendations, data on donning tests, harness tests and tests on infant-protector. It also contains information on the segments of the population tested, and copies of forms used in fitting and donning tests.

Final report on Part II: Forsyth rapid reading faceometer and data for headform design, by Stanley M. Garn, Edward E. Hunt, Jr., and George Maranjian. Jul 1952. 111p photos, drawings (part fold), tables Microfilm $5.00, Photocopy $15.25. PB 115104

The first section of the report constitutes a description of the Faceometer itself; the succeeding three sections include relevant information on its operation, maintenance and construction. Section five covers the anatomical landmarks, section six includes information on the recording of these measurements and landmarks. Section seven and eight provide the necessary information on the anthropometric cards, the code sheets for the IBM punch cards, and the IBM cards themselves. Section nine includes the statistical techniques used in developing the headform specifications, and section ten contains the specifications for a series of 14 graded headforms.

Logistics papers, prepared under various auspices. Issue no. II. Appendix I to Quarterly report no. 2, 16 Feb-15 May 1950, under Contract N7onr-419, Task order 4, Project NR 047-001. George Washington University, Washington, D. C. 1950? 116p graphs, tables (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photocopy $15.25. PB 114894

Contents: Linear programming and the theory of games, by David Gale, H. W. Kuhn, A. W. Tucker. - Notes on the concept of capacity and the measurement of capital intensity, by J. N. Behrman. - Probabilistic problems and military evaluation, an example, by C. Tompkins. - Selected supplementary bibliography of publications on inventory control, by Louise B. Haack. - Consumption as a random variable, by Joseph B. Kruskal, Jr. and J. Jay Wolf. - Protection from depletion of supply in the Bureau of Medicine and Surgery, by J. Jay Wolf and Joseph B. Kruskal, Jr.

Organization of applied research in Europe, the United States, and Canada. Organisation for European Economic Cooperation, Paris. Report of Technical assistance missions nos. 81-83. Order separate parts described below from Organisation for European Economic Cooperation, Publications Office, 2002 "P" St., N. W., Washington 6, D. C. at the prices indicated.

Vol. I: A comparative study. Apr 1954. 72p. $1.00. PB 115337

1. Scientific research 2. Industrial research.

Vol. II: Applied research in Europe. Apr 1954. 166p fold diagrs $2.00. PB 115338

1. Scientific research - Europe 2. Industrial research - Europe.

Vol. III: Applied research in the United States and Canada. Apr 1954. 115p diagrs $1.25. PB 115339

1. Scientific research - Canada 2. Scientific research - U. S. 3. Industrial research - U. S. 4. Industrial research - Canada.

Portable water-spray fire extinguisher for submarine use, by A. W. Bertschy, A. F. Armington, H. E. Moran, and R. L. Tuve. U. S. Naval Research Laboratory. Jun 1954. 19p photos, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111441

A portable first-aid fire extinguisher has been designed, developed, and tested. The extinguisher uses water, improved by the addition of a wetting agent, as an extinguishant; compressed air, which is stored in the same compartment as the water, supplies the operating force. To insure low electrical conductivity and high fire-extinguishing efficiency, the water is broken up by a special nozzle into a spray of optimum drop size. NRL R 4363.

Preliminary estimate of the cost of manufacturing fiber building board from straw, by G. D. Sinclair and H. R. Sallans. National Research Council of Canada. Prairie Regional Laboratory, Saskatoon, Canada. Apr 1954. 23p diagrs, graphs, tables Available from National Research Council of Canada, Ottawa 2, Canada. PP 115058

1. Fiberboard - Manufacture - Canada 2. Straw - Uses - Canada 3. NRCC 3283.

Report of the Mechanical Engineering Research Board with the Report of the Director of Mechanical Engineering Research for the year 1953. Gt. Brit. Dept. of Scientific and Industrial Research. Mechanical Engineering Research Board. 1954. 72p photos, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 115182

S. O. code no. 47-163-0-53.
1. Mechanical engineering - Research - Gt. Brit.

Report on the organization of industrial research in France, findings and recommendations of Mission OEEC-84 to France, organized by the Economic Cooperation Administration in cooperation with the Organization for European Economic Cooperation, the Ministry of Industry and Energy, and the Ministry of Economic Affairs of the Fourth Republic, Nov-Dec 1951. Organisation for European Economic Cooperation, Paris. 89p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $2.75. PB 111505

1. Industrial research - France 2. U. S. Economic Cooperation Administration 3. France. Ministry of Industry and Energy 4. France. Ministry of Economic Affairs.

Report of the Fire Research Board with the report of the Director of Fire Research for the year 1953. Gt. Brit. Dept. of Scientific and Industrial Research and Fire Offices' Committee. 1954. 58p photos, drawings, diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 114969

Cover title is "Fire Research, 1953". S. O. code no. 47-151-0-53.
1. Gt. Brit. Fire Offices' Committee 2. Gt. Brit. Fire Research Board 3. Fire control research - Gt. Brit. 4. Fire protection - Research - Gt. Brit.

Scientific research in British universities, 1953-54. Gt. Brit. Dept. of Scientific and Industrial Research. 1954. 527p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.25. PB 115118

S. O. code no. 47-174-0-54.
1. Scientific research - Institutions - Directories - Gt. Brit.

Semiannual progress report, 1 Jul 1953 to 31 Dec 1953. U. S. Air Force. Air Research and Development Command. Cambridge Research Center. Research Services Division, Cambridge, Mass. 1954. 40p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photocopy $5.25. PB 115210

1. Electronics - Research 2. Geophysics - Research 3. Scientific research.

Serial observations of drift currents in the central North Atlantic Ocean, by Henry Stommel. Woods Hole Oceanographic Institution, Woods Hole, Mass. Apr 1954. 29p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 114296

Contract Nonr-769(00), Project NR-083-069. Unpublished manuscript.
1. Currents, Ocean 2. Currents, Ocean - Velocity - Measurements 3. Oceanography - Research 4. WHOI Ref 54-26.

Soil survey procedure. Gt. Brit. Dept. of Scientific and Industrial Road Research Laboratory, Harmondsworth, England. 2nd ed. 1954. 36p photos, diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 100372r

Revision of PB 100372. S. O. code no. 47-110-15-54.
1. DSIR RR TP 15 2nd ed.

Structural features of the planetary nebulae. Annual summary report under Contract Nonr 809-100, Project NR 046-723, by Lawrence H. Aller. Michigan. University, Ann Arbor, Mich. and Carnegie Institution of Washington. Mount Wilson Observatory. Jul 1953. 6p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 113999

1. Nebulae - Radiation 2. Nebulae, Planetary - Isophotal contours - Measurements 3. Nebulae, Planetary - Spectrographic analysis.

Studies on the lipids and other extractives of marine invertebrates. Annual progress report, Jan 1-Dec 31, 1953, under Contract Nonr 253(00), NR-122-065, by Werner Bergmann. Yale University. Dept. of Chemistry. Jan 1954. 7p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 115105

1. Lipoids - Research 2. Invertebrates, Marine - Extractives 3. Palysterol - Structure.

Study of ice on an inland lake, by James T. Wilson, James H. Zumberge and E. W. Marshall. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Apr 1954. 85p photos, drawings, diagrs, maps, graphs (1 fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.00, Photocopy $11.50. PB 115410

Project 2030. Contracts DA-21-018-Eng-219 and DA-11-190-Eng-2.
1. Ice formation 2. Lakes - Ice formation 3. Ice - Crystallinity 4. SIPRE 5, Part 1.

Study of marine myxobacteria, by Theodore J. Starr and Erling J. Ordal. Washington. University. Dept. of Oceanography, Seattle, Wash. Dec 1953. 47p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photocopy $6.50. PB 114416

Contract N8onr-520/III, Project NR-083-012. Reference 53-4. Technical report no. 14.
1. Myxobacteria, Marine 2. WU OR 53-4.

Survey and treatment of marsh deposits: Bibliography, annotated. Highway Research Board. 1954. 105p Available from Highway Research Board, 2101 Constitution Ave., N. W., Washington 25, D. C. $1.20. PB 114456

National Research Council Publication 314.
1. Marsh deposits - Bibliography 2. Soils - Bibliography 3. Peat - Bibliography 4. HRC B 15 5. NRC 314.

Survival. U. S. Air Force. Dec 1952. 145p drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photocopy $18.75. PB 112819

1. Survival 2. AAF M 64-5.

Survival research, a report on the first year of development, prepared by E. Paul Torrance and staff (HRRL detachment #3). U. S. Air Force. Human Resources Research Laboratories, Bolling Air Force Base, Washington, D. C. Nov 1952. 27p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $3.75. PB 113170

1. Survival - Research 2. AAF HRRL MR29.

Sutochnye vertikal'nye migratsii zooplanktona i ikh zashchitno-prisposobitel'noe znachenie (Diurnal vertical migration of zooplankton and its significance in protective adaptation), by I. I. Nikolaev. Translated by I. C. Lecompte, edited by Margaret W. Raven. Jun 1954. 16p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 114679

Translated from Zoologicheskii Zhurnal, vol. 29, no. 6, 1950, p. 523-529.
1. Plankton - Migrations - Russia 2. Marine life - Migrations - Russia 3. NAVSHIPS T 564 4. STS 193.

Symposium on microseisms, held at Orden House, Harriman, N. Y., 4-6 Sep 1952, sponsored by the Office of Naval Research and the Geophysical Research Directorate of the U. S. Air Force. Dec 1953. 133p photo, maps, diagrs, graphs, tables Available from National Research Council, 2101 Constitution Ave., Washington 25, D. C. $1.00. PB 114208

Contents: Moderator's comments, by Perry Byerly. - Sketch of the history of microseismology, by J. B. Macelwane. - Tripartite stations and direction of approach of microseisms, by J. E. Ramirez. - Amplitude distribution of storm microseisms, by Marion H. Gilmore. - Microseismic period spectra and related problems in the Scandinavian area, by Markus Bath. - Can sea waves cause microseisms? by M. S. Longuet-Higgins. - Storm and surf microseisms, by F. W. van Straten. - Ocean as an acoustic system, by Frank Press and Maurice Ewing. - On theories of the origin of microseisms, by J. G. Scholte. NRC 306.

Technical report. Part I: Expanding gas model of the corona, by Donald E. Billings, Walter Orr Roberts, and Donald H. Liebenberg. Part II: Origin of white light coronal streamers, by Walter Orr Roberts, Raymond Grenchick, and Donald E. Billings. Harvard University. High Altitude Observatory, Boulder, Colo. Nov 1953. 14p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photocopy $2.75. PB 114614

Contract Nonr-393(02), Project NR-046-721/9-22-52.
1. Corona - Models 2. Solar phenomena.

Trafficability and navigability of delta-type coasts, trafficability and navigability of Louisiana coastal marshes. Technical report no. 2: Occurrence and development of mudflats along the Western Louisiana coasts, by James P. Morgan, Jack R. Van Lopik, Lewis G. Nichols. Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La. Apr 1953. 70p photos, maps, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photocopy $8.75. PB 110723

Contract N7onr-35608, Task order NR 088-002.
1. Sediment - Deposition - Louisiana 2. Geology - Louisiana.

Transfer processes operating at the ocean boundaries. Final report for period Mar 15, 1951-Apr 30, 1954, under Contract N7onr-48704, Project NR-083-071, by Robert O. Reid and William H. Clayton. Texas. Agricultural and Mechanical College. Dept. of Oceanography, College Station, Texas. May 1954. 10p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.50, Photocopy $1.50. PB 114682

A & M Project 30, Reference 54-38F. Research conducted through the Texas A & M Research Foundation in cooperation with the Gulf Coast Division of the Sun Oil Co.
1. Ocean surface - Momentum transfer 2. Ocean surface - Effects of wind stress 3. Oceanography - Research.

SELECTED LIST OF ATOMIC ENERGY REPORTS OF INTEREST TO INDUSTRY

The following Atomic Energy reports are listed here because of their interest and usefulness to general industry.

Reports may be purchased in accordance with instructions on the inside front cover of U. S. GOVERNMENT RESEARCH REPORTS. As PB numbers are not indicated, order by series and number. These reports may also be consulated at any AEC Depository Library. A list of these libraries may be obtained from the U. S. Department of Commerce, Office of Technical Services, Washington 25, D. C.

Reproduction in whole or part of any report listed herein is encouraged by the U. S. Atomic Energy Commission, subject to the approval of authors or originating sites. General inquiries from the industrial press about AEC-developed information should be directed to the Industrial Information Branch, Atomic Energy Commission, Washington 25, D. C.

BIOLOGY AND MEDICINE

Lecture notes; Health Physics Training Lectures, 1948-1949. Health Physics Division, Oak Ridge National Laboratory. September 29, 1950. Contract No. W-7405-eng-26. 102p. $.25. (AECU-817)

Health Physics Program for the Brookhaven Cosmotron, by F. P. Cowan and J. S. Handloser. Brookhaven National Laboratory. November, 1953. 32p. $.35. (BNL-264)

A comparison of computed and measured ground-level dose rates from radioargon emitted by the Brookhaven reactor stack, by Irving A. Singer. Brookhaven National Laboratory. May 1954. Contract No. AT(30-1)-gen-16. 42p. $.45. (BNL-292(T-49))

A performance study of laboratory fume hoods, by C. G. Detwiler. Knolls Atomic Power Laboratory. January 1954. Contract No. W-31-109 Eng-52. 13p. Microfilm $2.00, Photocopy $2.75. (KAPL-864)

Laboratory performance of fabric dust and fume collectors, by Charles E. Billings, Melvin W. First, Richard Dennis and Leslie Silverman. Harvard School of Public Health. August 31, 1954. Contract No. AT(30-1)841. 130p. Microfilm $5.25, Photocopy $16.50. (NYO-1590)

Annual report on research project, by G. Failla and H. H. Rossi. Radiological Research Laboratory, Columbia University. April 1, 1954. Contract No. AT-30-1-GEN-70. 149p. $.95. (NYO-4582)

Health Physics Division Semiannual Progress Report for period ending July 31, 1954, by K. Z. Morgan, Director. Oak Ridge National Laboratory. September 27, 1954. Contract No. W-7405-eng-26. 22p. Microfilm $2.25, Photocopy $4.00. (ORNL-1763)

Quarterly progress report, July 1 - September 30, 1953. Oak Ridge Institute of Nuclear Studies. Contract AT-40-1-Gen-33. 55p. Microfilm $3.00, Photocopy $7.75. (ORO-109)

Plant uptake of Sr^{90}, Ru^{106}, Cs^{137}, and Ce^{144} from three different types of soils, by Evan M. Romney, William A. Rhoads and Kermit Larson. Univ. of Calif., West Los Angeles, Calif. June 10, 1954. Contract No. AT-04-1-GEN-12. 28p. $.25. (UCLA-294)

Studies of flash burns: The influence of skin temperature in the production of cutaneous burns in swine, by K. M. Berkley, H. E. Pearse, and T. P. Davis. University of Rochester. Contract W-7401-eng-49. August 5, 1954. 60p. Microfilm $3.00, Photocopy $7.75. (UR-338)

Quarterly technical report April 1 thru June 30, 1954. Univ. of Rochester. August 26, 1954. Contract W-7401-eng-49. 41p. Microfilm $2.75, Photocopy $6.50. (UR-348)

An evaluation of black polyethylene as a skin simulant under fabrics exposed to thermal radiant energy, by George Mixter, Jr. and Thomas P. Davis. Univ. of Rochester. September 9, 1954. Contract W-7401-eng-49. 21p. Microfilm $2.25, Photocopy $4.00. (UR-353)

The effect of neutrons on thymic and circulating lymphocytes in the mouse, by R. E. Carter, E. P. Cronkite and V. P. Bond. November 19, 1953. 26p. Microfilm $2.25, Photocopy $4.00. (USNRDL-443)

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Unclassified bibliographies of interest to the Atomic Energy Commission. Supplement 1, by Hugh E. Voress. Technical Information Service. July 20, 1954. 19p. $.25. (TID-3043(Suppl. 1)

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Intelligibility of Speech. May 1954. $.10. CTR- 45

Leather and Fabric Gloves. March 1954. $.10. CTR-118

Lignin and Lignin Products. April 1954. $.10. CTR-147

Linoleum and Related Floor Coverings. March 1954. $.10. CTR-196

Liquid Air. April 1954. $.10. CTR- 81

Lithium and Lithium Compounds. April 1954. $.10. CTR-127

Loran. April 1953. $.10. CTR- 46

Luminescence, Fluorescence and Phosphorescence. March 1954. $.10. CTR-255

Manufacture of Board from Wood Wastes. March 1954. $.10. CTR-188

Manufacture of White Pigments. April 1954. $.10. CTR-223

Meat and Poultry (including Sausage Casings). May 1954. $.10. CTR-143

Molybdenum and Tungsten. April 1954. $.10. CTR-101

Non-Destructive Testing and Testing Equipment. April 1954. $.10. CTR- 48

Outboard Motors. April 1954. $.10. CTR- 22

Oxygen Generators. May 1954. $.10. CTR- 66

Ozone. April 1954. $.10. CTR-297

Packaging and Packaging Materials. March 1954. $.10. CTR- 72

Paint Removers. March 1954. $.10. CTR- 64

Paints, Varnishes and Lacquers. April 1954. $.10. CTR- 23

Paper Capacitors. May 1954. $.10. CTR- 99

Peat. May 1954. $.10. CTR-156

Perfume Materials. March 1954. $.10. CTR-224

Phosphorus, Phosphoric Acid and Sodium Phosphates. May 1954. $.10. CTR-135

Photographic Chemicals. April 1954. $.10. CTR- 70

Photographic Emulsions. April 1954. $.25. CTR- 74

Phthalic Anhydride. May 1954. $.10. CTR-217

Platinum and Platinum Alloys. February 1954. $.10. CTR- 73

Plywood and Veneers. April 1954. $.10. CTR-109

Potato Starch. February 1954. $.10. CTR- 92